20th Annual
Student Research and Creative Endeavor Symposium

MARCH 29, 2017

Sponsored by:
Office of Sponsored Programs ▼ Walter E. Helmke Library ▼ Honors Program
20th Annual Student Research and Creative Endeavor Symposium

Office of Sponsored Programs
Walter E. Helmke Library
Honors Program

20th Annual Student Research and Creative Endeavor Symposium
Wednesday, March 29, 2017
Program

Poster Judging Sessions: 9:00 am – 2:25 pm
Awards Ceremony: 3:30 pm

Symposium Sponsors

♦ Office of Sponsored Programs (OSP)
  Heidi Sandquist, Director of Sponsored Programs (sponsor and financial support)
♦ Walter E. Helmke Library
♦ Honors Program

Student Research Supported by the Office of Sponsored Programs

Student Research & Creative Endeavor:
https://www.ipfw.edu/offices/sponsored-programs/students/

♦ Undergraduate Summer Research Support Program
  Successful applicants engaged in faculty-mentored research or creative activities will receive $1,000 to support their research during the summer.

♦ Undergraduate Conference Travel Program
  To be eligible, a student involved in a faculty-mentored research project must have a paper accepted for presentation at a professional conference held in the United States. Successful applicants will receive up to $250 to defray costs.

Your Symposium Poster in Opus

One of the benefits of your participation in the Symposium is the archiving of your poster (with permission from you and your faculty mentor) in Opus, IPFW’s open-access online repository of research at http://opus.ipfw.edu/. Archiving your poster in Opus increases visibility and new readers for your content with world-wide accessibility via web search engines. You may track views and downloads of your poster using the Opus Author Dashboard and reports.

You will also be given a permanent stable URL to your work which can be used on resumes and applications. See examples of Symposium student posters at http://opus.ipfw.edu/stu_symp/
Contact Dean Alexis Smith Macklin, macklina@ipfw.edu, Helmke Library for questions about student and faculty mentor permissions and Opus.

Symposium Planning Committee

♦ Tina Gasnarez, Office of Sponsored Programs
♦ Susan M. Anderson, Helmke Library
♦ Damini Handa, Office of Sponsored Programs
♦ Ann Livschiz, Department of History
♦ Michele Shawver, Honors Program
Special thanks to our sponsors for their support:

3412 Fairfield Avenue, Fort Wayne, IN

437 E. Berry Street, Fort Wayne, IN

3417 North Anthony Blvd.                                        Indiana - Purdue Student Government Association
Fort Wayne, IN
260-422-JAVA
Our Thanks to Faculty Judges

Aitalieva, Nurgul -- Public Policy
Alasti, Hadi --- Computer, Electrical, and Technology
Bella, Peter --- Visual Communication and Design
Betz, Stacy --- Communication Sciences and Disorders
Buhr, Denise --- Helmke Library
Buttes, Stephen --- International Language and Culture Studies
Chen, Chao --- Computer Engineering
Chen, Dong --- Civil and Mechanical Engineering
Chen, Zesheng --- Computer Science
Daniel, Jaiyang --- Biology
Dattilo, Benjamin --- Biology
Davis, Carolyn --- Nursing
Ding, Suining --- Visual Communication and Design
Elahi, Behin --- Manufacturing & Construction Engineering Technology
Friedman, Ronald --- Chemistry
Gabbard, James --- Visual Communication and Design
Gillespie, Robert --- Biology
Hamash, Kawther --- Nursing
Hao, Qing --- Manufacturing and Construction Engineering Technology
Holland, Donna --- Sociology
Kaskel, Elizabeth --- Nursing
Keller, Elizabeth --- English and Linguistics
Kingsbury, Bruce --- Biology
Kopec, Andrew --- English and Linguistics
Kracher, Connie --- Dental Education
Lawton, Carol --- Psychology
Liu, David --- Computer Science
Lloyd, Kim --- Sociology
Malanson, Jeffrey --- History
Marshall, Jordan --- Biology
Marshall, Ann --- Helmke Library
Mikhail, Sally --- Physics
Montenegro, Andres --- Visual Communication and Design
Motz, John --- Visual Communication and Design
Mustafa, Ahmed --- Biology
Niazi, Fawad --- Civil & Mechanical Engineering
O'Connell, John --- Dean, Visual and Performing Arts
Qasim, Mohammad --- Chemistry
Reese, Pam --- Communication Sciences and Disorders
Reimer, Nila --- Nursing
Ross, Jody --- Psychology
Roste, Vaughn --- Music
Schuster, David --- History
Soule, Tanya --- Biology
Steiner, Sherrie --- Sociology
Stevenson, Steven --- Chemistry
Truesdell, Cheryl --- Helmke Library
Wark, Linda --- Human Services
Yoder, Ryan --- Psychology
Yoo, Jin Soung --- Computer Science
Zhang, Yuan --- Mathematics
2017 Student Participants (alphabetical) with Poster Numbers

1. Tessa Aby, Mason Frauhiger
2. Joshua Ainsworth
3. Candace Alexander
4. Alexis Atkins, Megan Dini
5. Janine Bennett
6. Kanisha Bevins
7. Bre Anne Briskey
8. Sarah Budd
9. Benjamin Burris
10. Aleia Campbell
11. Lucas Carstensen, Grant Music, Hannah Thompson, Rachel Schelling
12. Helena Carvalho Schmidt
13. David Cole
14. Quinn Collar
15. Obie Cruz
16. Stephen Danielian
17. Jonathan Danielson
18. Jedidiah Davis, Genni Newsham, Rachael Baker
19. Jedidiah Davis
20. Dan Deifenbaugh
21. Patsy DePew
22. Megan Dini, Alexis Atkins
23. Megan Dini, Alexis Atkins
24. Vanessa Drennen
25. Mason Frauhiger, Emma Steele, Joanna Stebing, Jack Carlson
26. Ian Gatchell
27. Megan Gerber
28. Seth Gick
29. Miriam Greidanus Romaneli, Kulood Alzayadi, Hannah Nissley, Melissa Pfefferkorn
30. Miriam Greidanus Romaneli, Elisa Hernandez
31. Jinlong Han
32. Cassandra Harter
33. Elisa Hernandez, Tyler Wallace
34. Elisa Hernandez, Jordan Brown, Manal Saeed
35. Cameron Hershberger
36. Lauren Hoffmann, Emma Zolman
37. Travis Isaacs
38. Andrew Jensen
39. Aaron Jones
40. Kumud Joshi
41. Jillian Josimovich
42. Grace Kessler, Alysha Brunton
43. Ian King
44. Aidan Kiraly
45. Austin Kuhn, Megi Shtika, Mikah Sunderman, Nivetha Pandian
46. Christopher LaFontaine
47. Jamison Law
48. Gretchen Luchauer
49. Amanda Martin
50. Amanda Meadows
51. Nicholas Miller
52. Sarah Moh, Geraln McGee
53. Maria Mohan
54. Asif Mortuza
55. Elizabeth Moser
56. Genni Newsham, Rachel Gilreath, Logan Thacker
57. Monica Ochola
58. Emilee Parke
59. Paige Pelkington
60. Carolyn Pendrick
61. Isaac Puff, Elbert Starks III, Adam Stucky, Lakeya Smith
62. Mary Pusti
63. Alexandria Rairigh
64. Bailey Rasavong
65. Kenneth Ray
66. Daphne Reicher, Avery Fiant, Jessica Field
67. Veronica Rice
68. Kaleb Robertson
69. Paige Robertson
70. Gabriela Romo
71. Maisie Ross, Gaeun Im
72. Abeer Saeed, Matt Spieth, Tabitha Vachon
73. Molly Schenkel
74. McKinzie Schmidt, Isaac Puff, Madalyn Jehl
75. Patrick Selig
76. Taylor Smith-Graber
77. Amanda Stoffer
78. Michael Stoller
79. Bethany Strasburg
80. Harlie Summers, Niswonger Kenneth, Tessa Aby, Dan Deifenbaugh
81. Levi Tapia
82. Kurtis Taylor
83. Hannah Thompson
84. Stacie Trahin, Amanda Howell, Sarah Daubenspeck
85. Elijah Vance
86. Luna Wahab
87. Jacienda Walter
88. Emily Wendel
89. Kaci Whitehead
90. Travis Wise
91. Matthew Wyss, Aaron Thieme
92. Nicholas Yergens, Elli Hernandez, Miriam Greidanus Romanelli, Jordan Brown
The Diversity of Payton County Park

Tessa Aby
Department of Biology

Mason Frauhiger
Department of Biology

Faculty Sponsor: Dr. Solomon A. Isiorho
Department of Biology

Payton County Park (PCP), located in Allen County, Indiana, reveals past topographical alterations, both anthropogenic and geologic in origin, evidenced by remnant structural debris and the glacially-induced wetlands within. In order to compare the degree of biodiversity present between various locations in the park, nine 30 x 30 meter plots were delineated throughout the forty-acre park; these plots were distributed by means of assessing the percentage area of woodlands, wetlands, and open field environments within the park and subsequently allocating a proportional amount of plots to the respective areas. Samples of water and soil from the plots, as well as measures of species richness from within and around the plots, were periodically collected and recorded beginning September 2016 and continuing until November of the same year. Sieve and water quality analyses revealed several north-trending tendencies, encompassed by a gradual increase in elevation, decrease in amount of silt and clay-sized particles, decrease in water saturation, as well as an increasing pH within the PCP pond. Considering all plots, maximum biodiversity occurred where wetland characteristics were present. Arthropod presence was found to be concentrated in plots of closer proximity to the PCP pond and previously-developed pastures; this was likely due to an abundance of blooming goldenrod. The degree of biodiversity in the plots surrounding Payton County Park’s pond may be due to a more extensive undisturbed existence, as opposed to areas of more recently developed/maintained portions of the park, which display characteristics typical of secondary succession. Comparing the degrees of biodiversity between plots provides an initial step towards characterizing the biodiversity of Payton County Park and identifying the internal and external factors which may influence it.
**Comic Book Study Through Roy Lichenstein**

Joshua Ainsworth  
Department of Visual Communication & Design

Faculty Sponsor: Professor Andres Montenegro  
Department of Visual Communication & Design

Creative project abstract: “Compositional Comic Book. Exploring Roy Lichenstein’s style through a sequential and storyboarding graphic format.”

I am presenting Creative project allowing me to research and understand Roy Lichenstein’s use of lines, colors, and design to create a comic book while allowing myself to experiment and design my own story based on his use of different emotional effects between pieces. The goals of my project:

1. Develop character(s) based on one piece of his work and apply the technique that he uses within that piece.
2. Study and illustrate use of his strokes while allowing myself to possibly understand his work in another medium.
3. Study and use the visual effects that Lichtenstein is able to replicate in animation and motion graphics.

The conclusion of this creative project will greatly impact in my future professional work as, not only an animator, but an illustrator as well to better understand how to become successful at telling a story while having a muse for a jumping point and, in the future, allowing me to create works through inspiration.
Biochemical characterization of two azaguanine-like membrane transporters from *Paenibacillus larvae*, the bacterial causative agent of the American Foulbrood Disease (AFB) in honey bee

Candace Alexander, Dr. George Mourad
Department of Biology

Faculty sponsor: Dr. George Mourad
Department of Biology

*Paenibacillus larvae* is the bacterial causative agent of American Foulbrood (AFB) Disease afflicting the hives of *Apis mellifera*, the honey bee. *P. larvae* spores carried into the hive by worker bees are shed into the royal jelly that bee larva feed on. Uric acid and L-tyrosine serve as germination cues upon the spores’ arrival in the larval midgut. Because these nitrogen-rich compounds are the cues that prompt the development of AFB, characterizing the proteins that transport such nitrogenous compounds from midgut into *P. larvae* spores could lay the foundation for developing alternative drug therapies. A BLAST search revealed that the genome of *P. larvae* encodes two putative proteins that share similarity with the azaguanine-like class of nucleobase transporters (AZG) from other organisms and we named them PlAZG1 and PlAZG2. To characterize the function of PlAZG1 and PlAZG2, we cloned and heterologously-expressed their genes in yeast cells (*Saccharomyces cerevisiae*) lacking their native nucleobase transporters. To determine substrate specificity, yeast cells expressing PlAZG1 or PlAZG2 were tested for their ability to uptake a panel of [³H]-nitrogenous bases. In addition, the binding affinity *Km*/*Ki* for some substrates/solutes was determined for PlAZG1 and PlAZG2. Using proton and sodium pump inhibitors, it was determined that PlAZG1 and PlAZG2 are nucleobase cation symporters driven by proton gradients.
Is Social Understanding Related to the Dark Triad?

Alexis Atkins
Department of Psychology

Megan Dini
Department of Psychology

Faculty Sponsor: Dr. Brenda Lundy
Department of Psychology

Theory of mind (ToM, or the tendency to consider the mental processes of others; Astington, 2003) has been linked to important social-relationship skills within the developmental literature (Hughes & Dunn, 1998; Keenan, 2003; Lalonde & Chandler, 1995; Peterson & Siegal, 2002; Slaughter, Dennis, & Pritchard, 2002; Watson, Nixon, Wilson, & Capage, 1999). The findings of a recent study suggest, however, that children's ToM may also be linked to more negative social characteristics (Sutton, Smith & Swettenham, 1999). Few studies have examined links between adult ToM and various types of social-personality characteristics. Given the recent findings of the link between children's ToM and manipulation, adults' ToM was explored in relation to negative attributes (i.e., machiavellianism). The purpose of the present research was to examine adults' level of engagement in ToM in relation to negative social-personality characteristics in the Dark Triad (machiavellianism, narcissism, and psychopathy). It was hypothesized that individuals with higher levels of ToM would be more likely to engage in negative personality characteristics, while those who reported lower levels of ToM would not. The relations among adults' ToM and negative (e.g., machiavellianism) social-personality characteristics were assessed using a sample of 123 undergraduate students (80 males and 43 females). Participants completed the Imposing Memories Task (IMT, a measure of ToM) and the Dirty Dozen (DD; Jonason & Webster, 2010), two tasks that have been used in previous literature.

Unlike some of the recent developmental research which we used to construct our hypothesis, we found that adults' ToM scores were inversely related to negative personality characteristics, such as manipulation (machiavellianism, \( r = -.22, p < .01 \)), narcissism (\( r = -.16, p < .05 \)) and psychopathy (\( r = .26, p < .005 \)). In other words, adults who scored higher on the ToM tasks were less likely to engage in negative personality characteristics (machiavellianism and narcissism). This suggests a positive link between children's ToM and negative characteristics (e.g., machiavellianism). The present findings contribute to the understanding of adult ToM in relation to social-personality characteristics. This is important because the use of ToM can help understand and predict bullying. Further research is needed to study the relations among these variables in real life situations.
The role of scytonemin in the adaptation to oxidative stress in cyanobacteria

Janine Bennett
Department of Biology

Faculty Sponsor: Dr. Tanya Soule
Department of Biology

Cyanobacteria are photosynthesizing organisms that live in environments open to solar ultraviolet radiation. In order to survive in these environments, some cyanobacteria produce sunscreen pigments. For these organisms, sunscreen pigments such as scytonemin intercept photons before they can harm cellular machinery, DNA, or produce reactive oxygen species (ROS), which are toxic to the cells. The specific aims of this project were to determine how the presence of scytonemin in the cyanobacterium *Nostoc punctiforme* contributes to fitness under oxidative stress and to provide insight into the molecular response to oxidative stress with and without the protection of scytonemin. To assess the physiological response, cells were first induced to produce scytonemin with long-wavelength UVA radiation. Then they were stressed with methylene blue for 30 min to induce production of ROS and evaluated for antioxidant enzyme activity. A control group without scytonemin and methylene blue stress were similarly evaluated. The gene expression response to oxidative stress was also measured with quantitative-PCR (qPCR) by targeting basic metabolic genes such as *psbA* (photosynthesis), *rbcL* (carbon-fixation), and *nifH* (nitrogen-fixation). In addition, the expression response of genes which encode for antioxidant enzymes such as *katE* and *cat* (catalase) and superoxide dismutase (*sodA*), were also measured. For the antioxidant enzyme activity analysis, cells with scytonemin produced less antioxidant activity than those without scytonemin, regardless of the presence or absence of oxidative stress. In the evaluation of the gene expression response, the results were more variable. Gene expression of *nifH* was upregulated in cells with scytonemin and oxidative stress, while the expression of *rbcL* was downregulated under similar conditions. In cells with scytonemin, expression of *cat* and *katE* were upregulated, while *sodA* was downregulated. Interestingly scytonemin appeared to suppress the antioxidant enzyme activity response while increasing the transcriptional response of catalase enzymes. This discrepancy could be explained by the fact that gene expression occurs before the translational or enzymatic response. Since the cells were only stressed for 30 min it is possible that the corresponding functional proteins were not active at the time of cell harvesting. Future studies will involve a temporal analysis of this response in order to better understand the contributions of scytonemin in coping with oxidative stress in *N. punctiforme*. 
Little Reads

Kanisha Bevins
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

My research project will be a project designed to improve and increase children’s literacy. An increase in literacy among children improves the future of individuals as well as society. It creates a better educated workforce and aids students as they pursue higher education.

Through extensive research in Indiana in conjunction with the library system, I have developed a literacy program for children. This program, titled Little Reads, encourages parents to become actively involved in early reading opportunities for their children. This program is designed to provide the basis building blocks for a better educated society due to a higher level of reading skills.
“Surviving” the Rwandan Genocide: The Impact of the Genocide on Survivors’ Later Mental Health

Bre Anne Briskey
Department of History
Department of Psychology

Faculty Sponsor: Dr. Ann Livschiz
Department of History

During the Rwandan genocide, over 800,000 Rwandans lost their lives over the course of just 100 days. From early April to early July 1994, the Rwandan government, headed by extremist Hutu military leaders, ordered the extermination of Rwandan Tutsis along with moderate Hutus. In addition to mass extermination, the government ordered a campaign of terror and violence; victims faced unimaginable atrocities such as torture, rape, and witnessing the deaths of people they knew. Only after the Rwandan Patriotic Front seized control of Rwanda did the genocide stop. Despite its short duration, the genocide continued to affect the survivors, even after many years had passed. Organizations such as the United Nations conducted interviews of the survivors in the years following the genocide. Numerous survivors had their interviews recorded in order to have a more complete perspective of what transpired during the Rwandan Genocide, in the hope of seeing perpetrators brought to justice. The experiences repeatedly recounted in the testimonies—seeing the murders of fellow Rwandans, the uncertainty regarding the murders, exposure to other violent acts, such as genocidal rape caused survivors excruciating psychological trauma. Research conducted found that survivors’ mental health was negatively affected by the genocide. In particular, gender played a role in survivors’ mental health; female survivors had a higher probability of developing depression and post-traumatic stress disorder than male survivors. In the testimonies, survivors of both genders referenced the negative impact mass violence and rape had on women. But while female survivors described their experiences during the genocide, such as genocidal rape, male survivors lamented on witnessing the effects of the genocide on their female family members. Female survivors have suffered the greatest long term physical and psychological trauma, that until recently has not been looked at. This finding potentially impacts the way that survivors of a genocide receive treatment.
Synthesis of Large-Cage Metallofullerenes with a Plasma Reactor

Sarah Budd
Department of Chemistry
Department of formerly known as Geosciences

Faculty Sponsor: Dr. Steven Stevenson
Department of Chemistry

There is a paucity of literature on the synthesis of metal-encapsulated fullerenes having cages of more than eighty carbon atoms. There is even less information on fine-tuning their synthesis. Our motivation is to investigate new ways of creating the larger metallofullerenes (e.g., Nd@C₈₈, Gd@C₈₈, CeSc₂@C₈₈, CeLu₂@C₈₈, and Gd@C₉₆). It is important for application development to have larger cage metallofullerenes. For example, much of the MRI contrast agent studies have been done with the smaller Gd@C₈₀ metallofullerenes. The Gd@C₈₈ has more reactive sites on its C₈₈ cage, and this feature would allow more water-soluble groups to be attached. This improved water solubility in conjunction with the higher molecular weight could influence the relaxivity and efficacy of the larger Gd@C₈₈-based MRI contrast agents.

In this presentation, we investigate the effect of chemical additives on our subsequent products. Solid powders that are introduced into the plasma include the following: copper, graphite, tin, aluminum, and the desired metal to be encapsulated. Our results show that the type and amount of additive does significantly influence the product distribution. Addition of various amounts of these substances influence the percent yield and yield in mass of metallofullerene extract.
Effects of Portal Protein Primary Structure Mutations on Viral Genomic Packaging Capabilities

Benjamin Burris
Department of Chemistry

Faculty Sponsor: Dr. Peng Jing
Department of Chemistry

The process by which bacteriophages package and maintain double-stranded DNA within the protein capsid has been subject to a great deal of research in recent years. Given the increased interest in particular fields of medicine, such as gene therapy, the desire to understand how the DNA packaging motor in the bacteriophages operates has opened many doors for revolutionary scientific research in the fields of biology, chemistry, biophysics and nanotechnology. Due to the universality of the structure of bacteriophages, the study of one particular bacteriophage could provide insight into other types of bacteriophages. As such, the bacteriophage Phi29 was utilized, and its DNA packaging motor is composed of a portal protein, packaging RNA and a viral ATPase. The focus of the research is on the portal protein that is a channel protein in the capsid of the bacteriophage through which the genome DNA can translocate during the DNA packaging. Many previous studies has indicated that the portal protein may not only serve as a passive conduit for the genome DNA but also play other critical roles during the packaging process. However, they are still intensively debated and discussed today. A recent study in our lab has found the portal protein may serve a Flashing Brownian ratchet in the packaging process, which can assist the packaging of the genome DNA against its concentration gradient across the portal protein at the late stage of DNA packaging. In order to study the relationship between the structure and the function of the portal proteins, we performed planar bilayer membrane measurements for mutant portal proteins. Within this experiment, we were able to establish a potential gradient across the membrane and use this potential to establish an ion selectivity for the membrane. From this point, the abilities of the portal protein to package an anionic genome were inferred. Our results have shown that the charges of the inner-ring amino acids alter the ion-selectivity of the channel which is pivotal to understanding the impacts of charges of amino acid residues on the genome packaging efficiency.
Psychological Flow and Personality

Aleia Campbell
Department of Psychology

Faculty Sponsor: Dr. Jay Jackson
Department of Psychology

Flow has been conceptualized as an intrinsically rewarding state of optimal experience that is enjoyable and uplifting. People who experience flow become so absorbed in what they are doing they lose temporal and self-awareness. Flow has been associated with a host of positive emotional and behavioral outcomes. In an effort to understand the determinants of flow, much research has focused on personality traits. For example, several studies have shown that people who are extraverted tend to exhibit high flow propensity, while introverts tend to exhibit relatively less flow propensity. We think this extraversion-flow link is potentially misguided because it does not consider the powerful role that situations can play in determining a wide-range of psychological states, including the extent to which introverts and extraverts experience flow. Our main proposition is that extraverts will tend to experience greater flow in group situations and less flow in solitary situations, while introverts will tend to experience greater flow in solitary situations, and less flow in group situations. We also explored several other potential personality-situation interactions on flow propensity.

To test our predictions, we asked participants (N = 195) to complete an online questionnaire. They completed a measure of introversion-extraversion and other personality traits. They then completed two measures of flow (The Flow Questionnaire, the Flow Proneness Questionnaire). Finally, participants indicated the extent to which they had experienced flow in 25 different situations, including social group situations (e.g., attending a concert with friends, going to a party), and solitary situations (e.g., reading an enjoyable book, writing a research paper). Our primary hypotheses were supported. Extraverts were significantly more likely to experience flow in social group situations than in solitary situations, while introverts were significantly more likely to experience flow in solitary situation than in social group situations. We also identified several other interesting personality-situation interactions on flow propensity.

Research suggests that flow is psychologically healthy state. It is therefore useful to identify the variables that determine or predict flow. Rather than emphasizing the role of personality characteristics, which is the dominant focus amongst flow scholars, our research suggests that a concurrent consideration of both personality and situational forces is necessary to fully understand the dynamics of flow.
Mental rotation is the ability to use a mental representation to rotate a two or three-dimensional object in the human mind while also recognizing that it is the same from any perspective. Previous studies have shown gender differences in mental rotation, with men performing mental rotations more quickly and accurately than women. Another study has shown that rotation practice using a joystick to rotate a figure on a computer screen benefits subsequent mental rotation. The purpose of our research was to examine whether mental rotation could be trained, specifically by using an iPad app we developed. In the current study, introductory psychology students were given a mental rotation pretest in which they viewed two geometric figures side by side and were asked if they were the same figures in different rotations, or two completely different figures. In the control group, participants completed additional trials identical to those in the pretest. In the experimental group, participants were asked to rotate a figure presented on the iPad with their finger until it matched the same orientation as the figure shown on the computer. The figure on the iPad started at different orientations than the figure on the computer (i.e., rotated 30 degrees along the x-axis, 90 degrees along the Y-axis). Finally, participants in both groups completed a posttest similar to the pretest, but including both familiar and unfamiliar figures.

We found that males were more accurate at rotating the figures in the pretest and posttest, replicating findings from previous studies. However, the iPad training did not improve mental rotation in the posttest in either females or males. Based on these findings, we conclude that our app does not engage people in thinking about mental representations of the figures and rotating them in their head. In a future project, we plan to examine whether mental rotation can be improved by training participants to attend to the specific axes around which the object is rotating. We believe this method will be more effective in engaging participants in the mental rotation of a three dimensional object.
Revising History: Exploring what Lies Below the Historical Cannon

Helena Carvalho Schmidt
Department of Communication
Department of English and Linguistics

Faculty Sponsor: Dr. Mary Ann Cain
Department of English and Linguistics

In this project, I illustrate the interdisciplinarity of international, intercultural creative writing and history through the construction of my short story, “The Lord of Pandemonium.” I wrote it for my class in Writing Fiction, in which I developed my own writing process based on drafting, research and revision in a multidisciplinary approach. Although multidisciplinarity in storytelling offer refers to the use of multiple media resources (picture, video, audio) which complement the story, my approach explores the steps taken in order to create a story in an existing historical context, honing in from other subject areas in academia but maintaining a single dimension to storytelling in written words. My process includes research of the cultural and international context as well as the process of revision. The research I have done contributed to the composition of the reality in which the story takes place: the period of instability immediately preceding the Rwanda genocide. I went through academic articles and online research of news pieces, which offered accounts and analysis of the genocide. Together, these offered the basic structuring of the world I wrote in. I used the compiled data to construct not only a three-dimensional “map” or “scheme” of the world in which the story takes place, but also a historical context that explains why things were the way they were at a political, cultural and individual level.

The second section of my process is based on revision, which prompted me to wonder how I could offer a different account of history. For revision I honed in on Diane Lefer’s essay “Breaking the ‘rules’ of story structure,” in which she argues in favor of the breaking of conventions in writing – how a story can be told in a new way. In other words, “how could I offer a different perspective to read this historical event?” Instead of weighing experiences against facts and trying to balance them out, I decided to expose facts through a narrative. Revision is about trying to get a fresh perspective on the story’s subject, so my story is about the people who do not show up in detail in history books or research. It is not factual in its character-driven plot, but every event that alters the character’s life and experiences is based on fact. Although I make use of history to bring life to the character, in my revision I honed in on individuality. How is an individual impacted by ethnic conflict, post-colonial society and which side does he take? How does that affect his perspective of the world and his personal relationships? As a person, how would this setting change the way a character sees the world? To me, that is a special kind of storytelling because I am focusing on the humanity behind history and on how people’s hands form and destroy their futures. That is what makes storytelling personal, relatable and even educational. Different perspectives, different opinions prompt learning and personal connections. My effort to try to reach for those who have not had their voices heard and trying to learn about an entirely different country is a form of creating and accepting dissent, new voices that contribute to political debate and reach people’s hearts. That public debate, which is essential for a functional democratic society, can be prompted by these revisions. I consider myself better for driving off the beaten path and deviating from our common historical knowledge. I think sharing this process can help other people learn, grow and see beyond the current, established and detached accounts of history and connect to the past in a more human way.
Monitoring Changes in IPFW Well Field along St. Joe River

David Cole
Department formerly known as Geosciences

Faculty Sponsor: Dr. Solomon Isiorho
Department of Biology

The seasonal variation in the quality and quantity of groundwater is an important component of a healthy ecosystem. A well field with 14 observation wells located within a wetland along the St. Joe River on the Indiana-University Purdue-University Fort Wayne (IPFW) campus was monitored for seven weeks to observe any trend in water quality and groundwater flow direction. Bore hole data was also analyzed to develop a lithology model of the area. The total dissolved solids, pH, and temperature of the well waters and surface water from the creek were measured. The pH varied with an increasing trend between 7 and 8.5. TDS ranged from 95 to 1024 ppm. The temperature had a decreasing trend from 20 °C to 14 °C due to change of season. The groundwater level ranged between 35.75 inches above surface level to 5.9 inches below surface level. The results indicate that the pH value is inversely proportional to the groundwater temperature. The well field is a recharge zone during the fall and a discharge zone in the winter. The soils in the borehole data log model could not be confidently identified with the tools available due to the location of the well field. This study shows the varied processes taking place and more data are needed to help in the management and maintenance of a healthy wetland ecosystem.
Walter Ruttmann Inspired Film

Quinn Collar
Department of Visual Communication & Design

Faculty Sponsor: Professor Andres Montenegro
Department of Visual Communication & Design

“Revisiting/Recreate Walter Ruttmann animating technique”

I am presenting a Creative project of a short film using the technique of abstracted animation based on the work of Walter Ruttmann. The main purpose of this creative project proposal is to get a better understanding of the animation technique used by Walter Ruttmann and how he used abstract shapes to tell multiple stories. The goals of my project are:

1. Develop a few different types of shape sequences similar to Ruttmann’s Opus 1.
2. Study and apply the color technique used in Walter Ruttmann’s films.
3. Study and apply Ruttmann’s various shape movements.
4. Understand how Walter Ruttmann converts one shape into the next in a way that is pleasing to the eye.
5. Show how Rittman’s work contributes to today’s animation.

The conclusion of this creative project will help give me a better understanding on how to integrate different animation techniques into my work. Exploring the style of Walter Guttmann will further give me the knowledge to become a better animator and graphic designer.
Understanding Futsol

Obie Cruz
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

My research for this poster is for the sport of futsal. Futsal is a sport that is very similar to soccer, but with several key differences. These differences are what makes the sport interesting. Futsal is played indoors on a smaller filed with fewer players on each team. This make the sport much faster paced and higher scoring than traditional soccer, which is one reason it is growing in popularity.

This project will detail and examine the growth of futsal in the United States, and the strategies required to assist this sport in continuing to grow. I will do this be creating aesthetically and visually engaging image and text combinations to educate and generate buzz for the sport of futsal. I did this by using graphic design techniques that create excitement for the viewer. Powerful images and graphics, combined with text, help to produce visually appealing material which encourages the viewer to want to learn more.
Eleven v. Eleven: American Soccer Periodical

Stephen Danielian
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

Currently, American soccer has very little visibility within mainstream media and available resources are not easily accessible. Research shows that popularity of the sport is growing in the United States and media focused on soccer is in a position to reach a wider audience. This thesis project is a magazine of approximately 50 pages and will be printed for distribution. The content covers information about soccer in North America, as well as around the world – highlighting key moments, people, and milestones in the sport’s history. Information is presented through full-color illustration with accompanying text to capture the attention of sports fans here in the United States. Through a more cost-effective publication by means of visual communication and graphic design knowledge and techniques, the culture of soccer can become more mainstream in American periodicals.

As a graphic designer and college level soccer player, I believe I can combine my knowledge of the game with my skills in illustration, design and page layout, to produce a publication that is equal to what is on the market. In addition to this, I feel that by mainstreaming the process using my skills as a designer, I will be able to produce a more cost effective publication. This will result in an expanded market that will potentially grow the sport even more. To achieve these results, I will be creating a new digital magazine for the soccer fan that can be viewed or downloaded for a lower cost than traditional media.
Factors Affecting the Population Dynamics of Thrips Vectors of Soybean Vein Necrosis Virus in Indiana

Jonathan Danielson
Department of Biology

Faculty Sponsor: Dr. Punya Nachappa
Department of Biology

Jonathan Danielson, Tim Loeffler, Stacy Keough, Dr. Jordan Marshall and Dr. Punya Nachappa

Soybean Vein Necrosis Associated Virus (SVNV) is an emerging Tospovirus that was first discovered in soybean fields in Tennessee in 2008. The disease was confirmed in Indiana in 2012. Tospoviruses, including SVNV, are exclusively transmitted from plant to plant via insect species called thrips. There is no published information on the factors influencing the population dynamics of thrips-infesting soybean and spread of SVNV. The present study was undertaken in 2013 and 2014 to better understand weather effects on the population dynamics of the primary vector, Neohydatothrips variabilis and secondary vectors, Frankliniella tritici and Frankliniella fusca. Specifically, we evaluated the influence of temperature and precipitation on seasonal abundance of the abovementioned thrips species caught using suction traps from the North Central Regional Soybean Aphid Suction Trap Network located in soybean fields throughout the state of Indiana. Our results show that population of Neohydatothrips variabilis peaked between 1-16 August each year. F. tritici populations peaked between 1-16 June and a second peak was observed in 1-16 August. Frankliniella fusca populations remained low but constant throughout the growing season. Approximately 25% of the variation in population dynamics of F. tritici and 4% of the variation in population dynamics of F. fusca can be explained by temperature. Temperature did not affect N. variabilis population. Precipitation did not impact either of the three thrips species. We hypothesize that variation in the population dynamics may be due to differences in host plant preferences of the three species. Neohydatothrips variabilis is monophagous, feeding mainly on soybeans, whereas F. tritici and F. fusca are polyphagous, colonizing many broad-leaved host plants, grasses, and maize during the growing season. Hence, soybean crop distribution, abundance, maturation and senescence likely has larger impact on N. variabilis population compared to weather variables. Beyond weather, factors including, agricultural practices, initial thrips population size, thrips behavior, and the presence of predators and parasites, can affect the number of thrips captured in suction traps. Hence, future studies should include additional parameters beyond temperature and precipitation.
Sexual assault is a pervasive public health issue; approximately 25% of women experience sexual assault (e.g., Fisher et al., 2000; Cantor et al., 2015). Consent promotion and bystander-intervention approaches are dominant models in sexual assault prevention; however, little is known about the impacts of alcohol consumption on people’s perceptions about their own ability to consent to sex or their ability to accurately assess their friend’s ability to consent to sex. Therefore, in this study, we examined the extent to which intoxicated individuals: (1) accurately estimate their own level of intoxication, (2) believe their ability to make decisions about sexual activity has been impaired, and (3) accurately estimate their friends’ levels of intoxication and decision-making related to issues of consent. We chose to present driving a vehicle as a point of comparison.

We conducted a naturalistic study in Midwestern U.S. bars, conducting one-to-one interviews with 124 intoxicated individuals, who were recruited in pairs. We asked them questions about their own and their friend’s ability to consent to sex and driving, along with their drinking and sexual history, demographic questions, and we measured their blood alcohol count (BAC). We found that 39% of participants inaccurately rated whether they were above or below legal limit. Meanwhile, 86% stated they could consent to sex, but only 49% stated that they could consent to drive. Moreover, few were aware of their friend’s actual levels of intoxication. Finally, although men had consumed significantly more drinks and had higher BACs than women (ps < .01), men were significantly more likely to allow their friends to have sex while impaired ($p < .001$). Prevention efforts aimed at drunk driving seem effective; however, this recognition of impairment does not transfer to sexual activity.
Impressions of Relationship and Couples’ Conflict

Jedidiah Davis
Department of Psychology

Faculty Sponsor: Dr. Jody Ross
Department of Psychology

Problem or Purpose
One major concern emerging on college campuses is the rise of intimate partner violence (IPV). At least 23% of college-aged women and 21% of college men report physical victimization from their partner (Witte, Kopkin, & Hollis, 2015). Fossos, Neighbors, Kaysen, and Hove (2007) found that perpetrators of IPV are five times more likely than nonperpetrators to use alcohol before committing a physical act, and half of IPV incidents on college campuses happen under the influence of alcohol (Witte et al., 2015). Witt and colleagues also discovered that people are less likely to find a perpetrator guilty of abuse when the perpetrator is under the influence of alcohol.

The current study examines whether the presence and/or frequency of alcohol use by a male perpetrator plays a role in how others assign blame for his IPV toward his female partner and how this relationship (between presence of alcohol and assigning blame) varies for participants with different backgrounds and attitudes. We predict that people will assign blame for IPV differently across our three conditions: (1) man does not use alcohol before becoming violent with his female partner, (2) man uses alcohol before becoming violent with his female partner, but his alcohol use is described as unusual for him, (3) man uses alcohol before becoming violent with his female partner, and he is described as someone who drinks regularly.

Procedures
Data are being collected this semester via a Qualtrics online survey; participants are undergraduates in IPFW elementary psychology classes. Participants are being randomly assigned to read one of three IPV scenarios involving male-to-female IPV, with the alcohol use context varying as described above. Participants will then complete questionnaires assessing their attributions of blame for the man’s IPV, their own drinking patterns, attitudes towards drinking, attitudes towards IPV, normative and dysfunctional personality traits, and personal history of IPV perpetration and victimization.

Results
We anticipate having approximately 200 participants to test our hypotheses for the symposium. We predict that participants will blame the perpetrator (i.e., not the victim) for his IPV in all scenarios, but that the use of alcohol will reduce some of the blame attributed to men in the alcohol use conditions. We predict that men in condition #2, where the man’s drinking of alcohol is depicted as unusual for him, will be viewed as the least blameworthy. We also predict that participants who have perpetrated higher levels of IPV in the past, those with more lenient attitudes toward IPV, and those with higher scores on a measure of antisocial personality will be less likely to consider the man in the scenario completely responsible for his violent behavior. Understanding how individuals attribute blame for IPV under varying alcohol contexts and in relation to personal history variables may be helpful to those prosecuting alleged abuse and in creating public information campaigns, especially targeted at communities where IPV and alcohol use are common, such as college campuses.
Seeps are places where groundwater comes to the surface from an aquifer. The seeps along the Upper Wabash River Basin were used as a surrogate for groundwater monitoring. Discharge was measured at each seep and compared to the precipitation data from the area. Water samples from selected seeps, and various streams in the Upper Wabash River Basin were collected and analyzed for temperature, pH, dissolved solids, electrical conductivity, dissolved oxygen, nitrate, nitrite, phosphate, and sulfate to determine the contamination levels in both the surface water and groundwater (seeps). Discharge from at least three seeps is constant but fluctuates depending on the local precipitation. Seepage discharge tends to increase within three or four days of the precipitation events. Water chemistry indicates that contaminants sometimes exceeded the allowed US EPA limits. Nitrates ranged from 0.01 – 53.1 mg/L for groundwater and 0.0 – 93.2 mg/L for streams. Nitrites ranged from 0.00 – 9.66 for groundwater and 0.00 – 0.21 mg/L for streams. Phosphates ranged from 0.00 – 49.00 mg/L for groundwater and 0.04 – 32.0 mg/L for streams. Sulfates ranged from 0 – 512 mg/L for groundwater and 0 – 112 mg/L for streams. Water analysis reveals nutrient levels frequently exceeded normal parameters in the samples tested. Contamination level appears higher in the groundwater than in the streams. Studying groundwater seeps provides an alternate low cost method of monitoring groundwater quality when drilling test wells is impractical.
A Case Study of Child Development: A Student Teacher’s Perspective

Patsy DePew
Department of Educational Studies

Faculty Sponsor: Dr. Julia Smith
Department of Educational Studies

Education of a child is mostly understood as teaching practices in schools, but education is also the child’s complete development. The purpose of this case study was to examine the multiple factors that influence a developing child’s cognitive, social emotional, language and physical development. The study considered the ecological factors based on Bronfenbrenner’s Ecological Theory (home, school and community) that contribute to the child’s learning and development (McDevitt & Ormrod, 2016). This case study uses Bronfenbrenner’s theory to examine the contextual influences on a developing child through analyzes of the child’s individual self within the microsystem of school, peers, family and community. This inquiry was a 15-week case study that was conducted at a local school in Fort Wayne Community Schools in which one child was observed in the school setting. During the fifteen weeks of the case study, I did six naturalistic observations of the child in the school setting, engaged in informal interviews with the child, teacher and other school staff and collected anecdotal field notes. As a student teacher intern and researcher, I also spent time working with the child one-on-one in the classroom and got to know him on a personal level. The observations were analyzed using concepts of child development research and theories of child development to learn about one child’s unique experience in the classroom. This case study demonstrated a real-life experience of a child and the influential factors of child development looking at cognitive, social emotional, language and physical development. Knowledge acquired during this study was understanding a child’s thought process of the world and learning, good relationships with peers, socialization, and the importance of active and competitive play in school for boys. This case study demonstrates the importance of not only to teaching and mentoring students in the classroom but accommodating content based on each students’ needs.
Do Attachments Predict How You Describe Your Romantic Partner?

Megan Dini
Department of Psychology

Alexis Atkins
Department of Psychology

Faculty Sponsor: Dr. Brenda Lundy
Department of Psychology

In the child developmental literature, parental mind-mindedness (or parents' tendency to represent their child in terms of their mental processes) has been found to predict differences in attachment security (e.g., Laranjo, Bernier & Meins, 2008; Lundy, 2003). Secure infant attachment relationships appear to be associated with their parents' ability to consider their child's mental processes. Research looking at adults use of mind-mindedness in relation to their attachment representations of their significant other has not yet been conducted. It is plausible that, secure attachment representations in adults may be similarly linked to their ability to describe their significant others in terms of mental characteristics (compared to behavioral or physical characteristics). The present research examines the relationship between adults' attachment representations and the use of mental attributes to describe their current romantic partner. We hypothesized that individuals with secure attachments would provide more mental descriptors of their current romantic partners, while those with insecure representations were expected to use fewer mental (and more physical and behavioral) descriptors.

We found a significant association between secure representations and the use of mental attributes to describe participant’s current romantic partner. Adults with fearful and preoccupied representations provided fewer mental comments and more behavioral descriptors. Adults' descriptions of romantic partners (mental versus behavioral or physical attributes) are significantly associated with attachment representations. This study suggests that mind-mindedness, interpreting the behavior of one’s significant other in terms of their mental states, is related to attachment representations. The findings suggest that adults' ability to connect with their romantic partner's mental processes may facilitate or be facilitated by their attachment representations.
Parental Depressive Symptoms and Attunement to Preschoolers’ Mental Processes

Megan Dini
Department of Psychology

Alexis Atkins
Department of Psychology

Faculty Sponsor: Dr. Brenda Lundy
Department of Psychology

Mothers with depression tend to engage in insensitive styles of interaction, which have been associated with delays or deficits in early socioemotional and cognitive development. Furthermore, decreased levels of sensitivity have been found, not only in clinically depressed mothers, but also in mothers with elevated symptoms of depression (e.g., Bettes, 1988; Donovan, Leavitt, & Walsh, 1998). While research has established that maternal interactional sensitivity is an important contributor in development, little research has been conducted concerning contributions from the father. This is important because in the United States, fathers are present in 72% of households, making them a large factor concerning nonmaternal care and interactions with children (Forbes, Cohn, Allen, & Lewinsohn, 2004). In the present research, depressive symptoms are expected to be negatively correlated with parental mind-mindedness (i.e., parents’ tendency to treat their children as individuals with independent minds; Meins, 1997), and parents’ sensitive attunement, or responsiveness, to their preschoolers’ mental processes during collaborative problem-solving. Parents completed a set of questionnaires, participated in a mind-mindedness interview, and collaborated with their child on a puzzle construction task. Parent-child interactions are coded for interactional attunement.

We found that both mothers and fathers who showed depressive symptoms used more control comments and fewer autonomy comments. In other words, both mothers and fathers who exhibited depressive symptoms were more likely to give directions and engage in control comments (e.g., “Put that there.”) when interacting with their child, and encourage less independent thinking. The present findings may contribute to the understanding of the relation between parental depression and interaction styles. Self-focused tendencies associated with depression and depressive symptoms may hinder parents’ ability to represent their children’s mental processes. The representation of mental processes is viewed as a precursor to the ability to respond appropriately and sensitively to children’s mental processes (Meins, 1999). Perhaps with additional research, intervention techniques could be developed to promote higher levels of mind-mindedness in those with a tendency to be self-focused, to promote more optimal developmental outcomes.
Animation of Kevin Gemin

Vanessa Drennen
Department of General Studies

Faculty Sponsor: Professor Andres Montenegro
Department of Visual Communication and Design

Creative project abstract: “Revisiting and Reinventing the Technique of Kevin Gemin.”

I am presenting a creative project to develop a short animation based on the work of Kevin Gemin, a French animator. The main purpose of this creative project proposal is to understand the animating technique of Kevin Gemin, and how he uses the somewhat unusual program of Flipnote Studio\(^1\) for his work. The impact of this technique is defined by its frame-by-frame method, and how the work of this artist can be applied today to Nintendo 3DS, 3D animation and gamin consoles. A fundamental goal of this project is to implement Gemin’s animation technique in the narrative of the short animation sequential process and how this process will help me to craft my own style of storyboarding and concept art.

The goals of my project are to:

- Develop a character based on his animations in 2D and 3D, and how he is multifaceted for multiple media: video games, cinematic, and Virtual Reality.
- Study transition effects in the video animations, and how they help to enhance the animation narrative.
- Study and apply Kevin Gemin’s visual effects in his animated sequences and cinematic videos, such as Fade In Fade Out, Blinds, Dissolve, etc.

The project will help me expand my knowledge and skill set as an artist and animator.

\(^1\) *Flipnote Studio* allows the user to create both word and picture-based notes with the stylus, add sound, and put them together to create frame-by-frame *flipbook*-style animations.

https://en.wikipedia.org/wiki/Flipnote_Studio
Analysis of 450myo Interbedded Limestone and Mudstone Strata from the Madison, Indiana Area

Mason Frauhiger  
Department formerly known as Geosciences, Department of Educational Studies

Emma Steele  
Department formerly known as Geosciences

Joanna Stebing  
Department of Philosophy

Jack Carlson  
Department formerly known as Geosciences

Faculty Sponsor: Dr. Benjamin Dattilo  
Department of Biology

Stratigraphic layers can be separated into various “units,” or “bundles” of rock layers, characterized by their fossil content, composition, and other defining factors. The environmental and ecological conditions during deposition shaped the nature of the layers and is reflected in the rocks themselves. By looking at the progression of layers, patterns emerge and cycles can be identified and described, allowing for reconstruction of the paleo-environment. A multidisciplinary approach using fossil ecology, rock texture, geochemistry, and correlative methods provides a means to describe and correlate stratigraphic units and layers in the Madison, Indiana area. Faunal abundance counts were recorded for limestone samples (~450myo) from three outcrops in and around Madison, Indiana. Cluster analysis of fossil abundance data displayed various faunal associations and the spatial and temporal arrangement of the taxa and samples. Clusters of taxa and samples will be plotted against the stratigraphy to see if they match how the layers were originally correlated. Thin section analysis was used to quantify phosphate levels and fragmentation in limestone samples; this was based on several classification schemes. Phosphate accumulation varied between layers, rock type, etc. How the phosphate forms and the duration of formation gives an indication of the paleo-environment and helps to correlate layers within the area. Cores of limestone samples were crushed into smaller pieces and placed into bags. Dust was removed after crushing each sample and the bagged pieces were selectively chosen to avoid contamination from weathered surfaces or labels written on the samples. The crushed pieces of each sample were then powdered and further prepared for XRF analysis. Carbonate analysis of the samples provides geochemical data which can be used to identify the precise composition of various layers, further constraining correlations between localities and showing how the strata may have formed. Waterfalls and other geomorphic features were identified in the Madison, Indiana area for to correlate cycles. The data gathered can be plotted against the stratigraphy of the area, showing any potential intervals which correlate with each other. Faunal assemblages common to the area were present, reflecting changing environmental conditions. Based on prior research, we expect to find more phosphate in rocks having higher degrees of fragmentation and reworking, suggesting a longer formation period for the phosphate. The integration of various approaches to correlate layers allows for a higher resolution of the stratigraphy. By increasing the resolution between the three outcrops, further paleo-ecological and paleo-environmental parameters can be revealed. The data collected gives an indication of how the cyclic limestone and mudstone strata formed and thus allows for a more complete understanding of the fluctuating environmental conditions in the Madison, Indiana area.
Molecular and biochemical characterization of a novel guanine/hypoxanthine transporter from *Erwinia amylovora*

Ian Gatchell, Dr. George Mourad
Department of Biology

Faculty Sponsor: Dr. George Mourad
Department of Biology

The bacteria *Erwinia amylovora* is the causative agent of fire blight disease affecting members of the Rosaceae family. Infection occurs when *Erwinia amylovora* enters the plant via surface wounds then moves to the vascular system. To establish infection, *E. amylovora* must transport nucleobases, nitrogen rich compounds, from the plant into their cells. Such a process necessitates membrane transporter proteins. BLAST searches revealed that the genome of *E. amylovora* encodes a few putative nucleobase transporters. One such transporter, EaYjcD, has a high degree of amino acid similarity and identity to the known YjcD transporter from *E. coli*. YjcD is a member of the Nucleobase Cation Symporter-2 (NCS2) family of transporters. To identify the solute specificity of EaYjcD, the gene encoding EaYjcD was cloned and expressed in *E. coli* cells deficient in their native YjcD. *E. coli* cells expressing EaYjcD were tested for their ability to move a panel of different radiolabeled nucleobases from the growth medium into their cells revealing the substrate specificity of EaYjcD. Biochemical kinetic parameters including substrate binding affinity (K\textsubscript{m}) and rate of uptake (V\textsubscript{max}) of the substrates was also determined. Such biochemical characterization of EaYjcD provides a target for designing inhibitory drugs to treat fire blight infection.
Diversity of the cloacal mycobiome of the juvenile green sea turtle (*Chelonia mydas*)

Megan Gerber  
Department of Biology

Faculty Sponsor: Dr. Tanya Soule  
Department of Biology

The animal microbiome has rapidly become of great interest in current research as the microbiome is considered to be of vital importance to the survival of its host. Most studies have focused on bacterial communities due to their large populations and their smaller genomes. However, there are other understudied groups, such as fungi, which may also be important to improving our knowledge of their roles with their hosts. In this study we aim to identify the fungal communities within the cloaca of green sea turtles (*Chelonia mydas*) with the secondary goal of discovering whether these communities vary by ontogenetic shift in habitat. Pelagic-stage turtles were sampled from the Port of Venice, Louisiana while neritic juveniles were sampled from along the beachfront of Santa Rosa Island, Florida. Cloacal swabs were collected and stored at –20°C until DNA extraction. The fungal ITS regions were amplified using PCR and cloned into the pGEM-T vector for selection and sequencing. Samples from six individual turtles resulted in 30 clones which show that the majority of the fungal communities in the cloaca are dominated by the phylum Ascomycota, which includes the genera *Candida*, *Cladosporium*, *Podospora*, and *Epicoccum*. Other fungi identified include strains of *Exophiala* and *Malassezia*. The overall fungal community of the cloaca is primarily dominated by cellulolytic fungi, especially in the neritic sea turtles. A majority of the fungi identified are common on the dermis of animals, while others, such as *Epicoccum nigrum*, may even have some antimicrobial properties to aid the host in avoiding pathogens. At present, and to the best of our knowledge, there have been no other studies made in an attempt to characterize and identify the mycobiome of healthy, juvenile green sea turtles.
47 Seconds

Seth Gick
Department of English and Linguistics

Faculty Sponsor: Dr. Mary Ann Cain
Department of English and Linguistics

47 Seconds is a fictional story focusing on police shooting between a white officer and black victim. It is meant to mirror current events but is not based on any particular one. The purpose of this story is to illustrate how these tragic events affect the lives of everyone involved. It offers possible reasons for why an officer may shoot a suspect. The intent of the story is to prompt the reader into giving more consideration to those reasons before passing judgement.

The idea came from an assignment to write a short story with relevance to current culture or events. I wanted a familiar topic that would resonate with readers. While most would not have personal experience with a police shooting, they would be aware of them. Before I began, I looked at some of the most visible examples of police shootings and considered why they received so much attention. The ones that garnered the most scrutiny often involved a black suspect and white officer. Shootings such as Terence Crutcher of Tulsa, William Chapman of Portsmouth, and Sylville Smith of Milwaukee served as grim inspiration for this piece. Each situation varied greatly but the outcome was the same. Race seemed to be an important factor relating to the attention these shootings received. For that reason I considered several different roles and narrative arcs involving race.

Initially, I considered a black officer and white victim to show the inverse of the idea that black suspects are much more likely to be shot than white suspects. It felt less impactful and relevant because whites are not perceived as being discriminated against. An event mirroring current issues carried more weight. Using the inverse of the current events, a black officer and white victim, felt like I was trying to promote the idea that these shootings happen to everyone and aren’t an issue. That wasn’t what I wanted to convey and seemed likely to alienate and further polarize readers. By choosing details mirroring current events and then showing that event from a different angle, I hoped to lessen the divide and inspire more understanding in the reader.

I wanted to show the weight of taking a life, regardless of race. The fatal encounter was left until the latter portion of the story to keep the focus on the officer instead of the shooting. The focus is often on the person who is shot and the person who pulled the trigger is viewed as a perpetrator. I wanted to illuminate how convoluted the idea of the victim actually is in these situations. It isn’t meant to detract from the tragedy of these events but amplify it. Most officers don’t want to take a life anymore than someone wants to lose theirs. The outcome of these situations can be hard to comprehend. When race is involved, it can become an easy scapegoat. I wanted this story to convey that idea and show how tragic these events can truly be for everyone involved.
The relationship between personality traits and attitudes toward text messages responses

Miriam Greidanus Romanelli  
Department of Communication  
Department of Psychology

Kulood Alzayadi  
Department of Psychology  
Department of Sociology

Hannah Nissley  
Department of Psychology

Melissa Pfefferkorn  
Department of Psychology

Faculty Sponsor: Dr. Michelle Drouin  
Department of Psychology

In recent years, technology has become a main means of communication for many people. One of the major ways to use technology for communications is text or instant messaging. The increase of text-based communication has introduced emoticons as a way of expressing emotion in text. Emoticon use has demonstrated to have its own conventions related to, for instance, placement of emoticons in instant messages or texts, and choice of emoticon (Garrison, Remley, Thomas & Wierszewski, 2011). Additionally, the use of emoticons in a text message, unlike its textual content, has an effect on individuals’ opinions of the sender (Ganster, Eimler, & Kramer, 2012). As the language used in text messaging was found to be correlated with personality traits (Holtgraves, 2011), personality traits may also interact with the influence of emoticons on attitudes about the sender and mood of the receiver. In addition to personality traits, a factor influencing emoticon use is gender, as Toussel et al. (2012) found that women were more likely to use emoticons, but men were more flexible with their use of emoticons. Expanding on those findings, and looking into how men and women react to receiving an emoticon response, the present study set out to examine the gender differences and personality factors that might be related to the perceptions of emoticon use in recipients of text messages. Two-hundred-and-eighteen undergraduate students from a regional university were surveyed. Participants were shown several negative text messages followed either by a supportive text, a sad emoticon or no response at all. The participants were then asked to rate, on a seven-point likert scale, how they felt about that response. The participants also completed the Big Five Inventory, Emotional Intelligence Scale, Emotional Expressivity Scale, Toronto Empathy Questionnaire, Toronto Alexithymia Scale, and the Dirty Dozen scale. A 2 (gender) x 3 (response type) mixed group ANOVA showed there was no effect of gender and that gender did not interact with response type. The main effect of response type, however, was significant. Participants valued supportive texts, more than sad emoticons, and both responses more than no response at all. Correlational analyses showed that participants who were more agreeable, more conscientious and higher in emotional intelligence were more critical of the no-response condition. Participants that scored higher in emotional intelligence, higher in empathy, and lower in alexithymia and psychopathy were more appreciative of the supportive text condition. Those participants that scored higher in emotional expressivity tended to be more critical of the sad face response. While the use of emoticons in interpersonal communication has become increasingly common, especially with friends and family members, this research suggests that emoticons elicit different, and often more negative, reactions than carefully-worded textual responses. Thus, careful consideration of their use in the context of close relationships might be beneficial in avoiding miscommunication and offering support.
No One Wants to Chat with Bots: Building E-Social Capital

Miriam Greidanus Romaneli
Departments of Communication
Department of Psychology

Elli Hernandez
Department of Psychology

Faculty Sponsor: Dr. Michelle Drouin
Department of Psychology

According to the latest Pew statistics, 65% of Americans use social media, and most log on to at least one social networking site (SNS) daily (Duggan, 2015; Perrin, 2015). Many individuals and businesses capitalize on this online activity, using SNS to reach out to potential connections and consumers, in efforts to increase online ties with others, or e-social capital (Benson Filippaios, & Morgan, 2010; Boyd & Ellison, 2007). Thus, SNS marketing is a major focus area for many businesses and entrepreneurs. Although this is an area of growth for businesses, only a few studies have examined which linguistic characteristics of e-communication are perceived as relationship-building. In this exploratory study, we examine the natural language patterns of initial SNS messages from unknown others that are perceived as alienating (impersonal) or intimacy-building (personal), and we also ask individuals to delineate the qualities of personal and impersonal messages. In doing so, we aim to create guidelines for the construction of personal messages to unknown others via SNS. Analyses show significant differences between personal and impersonal messages in nearly every linguistic category we measured. Using our findings as a guideline, we suggest that e-marketers wanting to build relationships should craft messages containing certain word categories and words that appeal to recipients’ personal characteristics and interests.
Dynamics of Soybean vein necrosis virus replication in vector soybean thrips (Neohydathothrips variabilis)

Jinlong Han
Department of Biology

Faculty Sponsor: Dr. Punya Nachappa
Department of Biology

Authors: Jinlong Han¹, Vamsi Nalam¹, I-Chen Yu² and Punya Nachappa¹
¹Department of Biology, Indiana University Purdue-University Fort Wayne, ²Indiana University School of Medicine, Fort Wayne, IN 46805

Soybean vein necrosis virus (SVNV) is an emerging viral disease affecting soybean. Currently, SVNV is the most prevalent virus in soybean production in the United States. SVNV has been identified as a new species in the genus Tospovirus, which are exclusively transmitted by thrips. Soybean thrips, Neohydathothrips (N.) variabilis, is the only confirmed vector of SVNV. In this study, SVNV acquisition by N. variabilis first instars, the larvae after 1-2 days’ emergence from eggs, was investigated after 6h, 12h, and 24h of feeding on SVNV-infected plants, which is termed as acquisition access period (AAP). A further study on the dynamics of virus replication within infected thrips was also conducted. Immunofluorescence microscopy was used to show that N. variabilis acquired SVNV after 6h, 12h, and 24h AAP with replication occurring in the various tissues of the alimentary canal and salivary glands as indicated by immunodetection of a viral protein, called nucleocapsid protein (NP). Preliminary results suggests that the midgut epithelial cells are the initial sites of entry for SVNV and that the virus subsequently infects the surrounding muscles cells and eventually the salivary glands. SVNV was able to infect the alimentary canal after 6h of AAP but, interestingly, unable to infect the salivary glands, which is a pre-requisite for successful transmission of the virus. Hence, successful transmission not only depends on virus acquisition but also replication in the thrips vector. In the long-term, results of this study will increase fundamental and applied knowledge of the biology of thrips vector that affect the epidemiology of SVNV.
Our society faces a large amount of fear and emotions surrounding the ideology of death. The intent of my project is to create a way that we as a society can come to understand the importance of better expressing our views on death and its relationship in the life cycle. My project is an effort to answer questions concerning death and create a means in which we can all more fully understand how to cope with the aspect of the life cycle.

The process and product I will be creating to address the issue of death and the life cycle, will be to create a company that will promote and produce end of life celebrations for individuals. My company, “Bucket Party”, will work with individuals and families to create a celebration of life party that will take place while a person is still alive. This will allow the individual a chance to gather with family and friends to celebrate and reflect upon their life. By doing this, I hope to show that by celebrating an individual’s life and accomplishments, they can better come to terms with the end of life.

I have already hosted one such party and the results and impact were profound. I hosted a Bucket party for a military veteran who was dying of cancer. Family, friends and loved ones gathered together to celebrate the life and accomplishments of this individual. Doing this prior to death is a unique and profound way to celebrate life and come to terms with mortality.
Liar, Liar, Tweets on Fire

Elisa Hernandez
Department of Psychology

Tyler Wallace
Department of Psychology

Faculty Sponsor: Dr. Michelle Drouin
Department of Psychology

Numerous researchers have examined trust and honesty on the internet; however, only a few (e.g., Toma, Jiang, & Hancock, 2016) have contrasted self- and other- honesty online, and no known studies have considered how these assessments of online lying (self vs. other) vary across different types of online venues. Therefore, in this study, we examined self-honesty and perceptions of others' honesty across four online venues (i.e., social networking, online dating, chat rooms, and sexual communication websites), the individual characteristics (i.e., psychological characteristics) that predict self-honesty online, and people's stated motivations for lying online in a sample of U.S. adults.

Participants self-reported online deception across four different online venues (i.e., social media, online dating, anonymous chat rooms, and sexual websites) in a sample of 272 U.S. adults (average age = 32.22 years) recruited through Amazon's MTurk. Participants also completed demographic and personality measures.

Few participants (16%–32%) reported that they were always honest across these sites, and even fewer (0–2%) suspected that others were always honest in these different online venues. In terms of types of lie, most (55–90%) believed that others were at least sometimes lying about their age, gender, activities, interests, and appearance across the four online venues. Most participants (90%) expected others to lie at least sometimes about their appearance and 55% percent expected others to lie at least sometimes about their gender. However, although they expected people to lie more about their gender on sites with more anonymity and invisibility (like anonymous chat rooms and sexual websites), they expected equal rates of lies about appearance across all four websites, even on sites where users provide pictures and have shared acquaintances. Our measured psychological characteristics (Machiavellianism, psychopathy, and extraversion) were less indicative of participants’ lying behavior than their own expectations of the lying behavior of others. The importance of mutuality was further reinforced by qualitative comments that showed that, in addition to lying to look more attractive or for privacy or protection concerns, some people lie “because everyone lies on the internet.”

Our findings reinforce the idea that the online environment is full of deceit of many varieties, and that in some online venues, particularly those with more anonymity and invisibility, online deception is the rule, not the exception.
Social Network Behavior and Romantic Relationships: A Cross-lagged Panel Analysis

Elisa Hernandez, Jordan Brown, Manal Saeed
Department of Psychology

Faculty Sponsor: Dr. Daniel Miller
Department of Psychology

Social networking and its impact on relationships has attracted the attention of both media outlets and researchers. Most of this attention has portrayed social networking as a negative influence on romantic relationships (Utz & Beukeboom, 2011). This negative reputation may be well-deserved as Facebook has been cited in one-third of divorces in the past few years (e.g., Goldwert, 2012), and recent empirical research has shown that social networking is related to physical and emotional cheating, breakups, and divorce (Clayton, Nagurney, & Smith, 2013). However, the majority of this work measures relationship and social networking variables at a single timepoint. Thus, the directionality of this influence is unclear. The current research takes a longitudinal approach, examining social networking relationship behaviors and relationship investment, commitment, and satisfaction at two time periods. This design allows for cross-lagged panel analysis to infer the directionality of these correlations.

Young adult undergraduates (\(N = 146\)) currently in romantic relationships completed two online questionnaires spaced between 10 and 15 weeks apart. At both times the questionnaires included Rusbult’s Investment Model Scale and 17 items measuring online behaviors described below.

A factor analysis of the 17 online behavior items indicated a 5-factor solution: Public Praise (e.g., public praise for partner), Public Criticism (e.g., public criticism of partner), Flirtation (e.g., commenting on flirtatious posts made by others), Relationship Ambiguity (e.g., changing your relationship status to “it’s complicated”), and Highlighting Alternatives (e.g., posting pictures of an ex). Cross-lagged panel analysis indicated that most of these online behaviors are driven by relationship variables rather than the other way around. In other words, it is dissatisfaction and lack of commitment in relationships that drive people to criticize their partners, obscure their relationship status, and broadcast their alternatives. However, there were some behaviors that were not merely reflections of the condition of the relationship. Flirting behavior reduced later commitment and satisfaction, while increasing later quality of alternatives. In addition, publicly praising one’s partner decreased the later quality of alternatives.

Assertions that social networks have harmful effects on romantic relationships may be overstated. Our study suggests that social networking behaviors reflect rather than impact relationships. However there are some exceptions (i.e. flirting). Finally, this study demonstrates that some online behaviors (i.e. public praise) are actually relationship enhancing instead of relationship diminishing.
Use of Virtual Reality in Education

Cameron Hershberger
Department of Visual Communication and Design

Faculty Sponsor: Professor Andres Montenegro
Department of Visual Communication and Design

I am presenting a Creative/Research project of a Virtual Reality experience that recreates a significant historical moments in (select a specific topic, examples: US first colonies, or Native American architecture, reconstruction of the Mayflower travel, reconstruction of the Hanging gardens of Babylon, etc.) and lets the User experience them in person. This project was inspired by the Video Game series Assassins Creed in which a technology company invents a machine that uses the DNA of the subject and allows them to relive the memories of their ancestors. The goals of my project are:

1. Develop 3D Environments that are historically and geographically accurate (describe the topic of your choice)

2. Study how students react to learning history in a VR environment instead of the traditional classroom setting.

3. Research the technological implementation of the VR prototype.

4. Impact of the research/ creative project in historians, and scholarly community.

5. Develop other implications of this technology in other educational subjects (Science, English, Biology, etc.)

The conclusions of this creative project will have a great impact in my future professional work as an animator/3D Modeler, and to understand how to become a successful member of the animation/modeling industry.
Thrips Choice Tests on Uninfected/Infected Soybean Plants Demonstrate Mechanism of SVNV Transmittance

Lauren Hoffmann  
Department of Biology

Emma Zolman  
Department of Biology

Faculty Sponsor: Dr. Punya Nachappa  
Department of Biology

Authors: Lauren Hoffmann, Emma Zolman, Jinlong Han and Dr. Punya Nachappa  
Department of Biology, Indiana University-Purdue University Fort Wayne, Fort Wayne, IN 46805

From its original discovery in 2008, the Soybean vein necrosis virus (SVNV), first prevalent in Tennessee, has since spread to fifteen states in the Northern region. Typically vectored by thrips, the Tospovirus genus virus’ effects are gaining attention even as SVNV’s agricultural importance has yet to be fully assessed. Currently, soybean thrips is considered the primary vector or most efficient transmitter of the virus, whereas tobacco thrips and eastern flower thrips are secondary vectors. The purpose of this study was the following: Investigate the mechanism by which thrips spread the virus from plant to plant by conducting choice tests. Choice tests were conducted in enclosed structures to isolate an individual leaf connected to two distinct living plants. Six SVNV-infected thrips were released inside the enclosure. This allowed for random choice of the thrips. The choice-test can explain whether infected thrips (1) prefer to feed on uninfected plants rather than infected plants or (2) thrips show no feeding preference at all. A series of twenty non-choice tests were completed using two uninfected plants to reveal thrips preference in a control setting. The results showed an approximately 1:1 preference for the two leaves, which laid the groundwork to support the non-random preference of virus transmittance. A second set of twenty choice tests were completed using one infected and one non-infected plant to reveal thrips preference. The choice-test showed all of the infected thrips preferred to feed on the uninfected plant. This suggests that as SVNV-infected thrips feed and infect a healthy plant their offspring will become infected which could lead to increased virus transmission as a result of increased population of viruliferous thrips.
Identification and characterization of Soybean aphid amino acid transporters involved in Glutamine transport at the aphid/Buchnera symbiotic interface

Travis Isaacs  
Department of Biology

Faculty Sponsor: Dr. Vamsi Nalam  
Department of Biology

In aphids, the supply of essential amino acids depends on an ancient nutritional symbiotic association with the gamma-proteobacterium, *Buchnera aphidicola*. The endosymbiont converts abundant non-essential amino acids into essential amino acids that are supplied to the aphid. Little is known of the soybean aphid (*Aphis glycines*) amino acid transporters (AATs) that facilitate this exchange. The identification and characterization of AATs will provide information to allow for the exploitation of the biochemical interdependence that exists between *A. glycines* and *Buchnera aphidicola* to develop effective aphid resistance in soybeans (*Glycine max*). In pea aphids, the most active AAT, *Acyrthosiphon pisum* glutamine transporter 1 (ApGLNT1), a glutamine transporter is also competitively inhibited by the amino acid arginine. Using a bioinformatics approach, the homolog of ApGLNT1 has been identified in soybean aphids. The objectives of this study are to: (1) Clone and isolate the soybean aphid homolog of ApGLNT1 and (2) Determine if a mechanism of glutamine transport and substrate feedback inhibition that controls the biosynthesis of essential amino acids exists for glutamine transport in *A. glycines*. The soybean aphid homolog is cloned using primers developed based on similarity with ApGLNT1 from *Buchnera* cells isolated from soybean aphids. Feeding trials conducted using varying concentrations of arginine show that a similar mechanism of transport and substrate feedback inhibition exists in soybean aphids. The data generated by this study will serve as a foundation for subsequent studies on the characterization of transporters in soybean and soybean aphids, which may ultimately provide tools not only for the development of aphid resistant soybean.
Mandatory Pre-suit Arbitration Clauses in Employment Contracts

Andrew Jensen
Department of Accounting and Finance

Faculty Sponsors: Dr. Kauffman Kent
Department of Accounting and Finance

Today, arbitration clauses are commonly found in employment contracts. This research looks at the Federal Arbitration Act and U.S. Supreme Court cases and other appellate case law on whether it is constitutional to require employees to submit to pre-suit arbitration clauses as a condition of employment, thus preventing them from filing lawsuits over any employment related claims, such as wrongful termination or discrimination or harassment. The research showed that federal courts are split over whether mandatory pre-suit arbitration clauses in employment contracts are constitutional.
Scytonemin is an indole-alkaloid pigment synthesized by many strains of cyanobacteria. Scytonemin biosynthesis is induced under long wavelength UVA stress and functions as a sunscreen pigment for cyanobacteria to protect them from the harmful effects of UV radiation. Furthermore, scytonemin has been shown to have anti-inflammatory and anti-proliferative properties. It has been used in past research as an inhibitor of Plk1 to decrease proliferation in myeloma cells. Plk1 not only plays a role in cell proliferation, but also promotes the G2-M transition in the cell cycle. Thus the objectives of this research are to evaluate the effect of scytonemin on melanoma tumor cell growth and spleen cell proliferation, which indicates an enhanced immune response. Scytonemin was extracted from the cyanobacterium *Nostoc punctiforme* ATCC 29133 following UVA stress using 100% acetone. The crude pigment extracts were then dried to completion and dissolved in DMSO for a final concentration of 28 mg ml$^{-1}$ which was diluted for all the assays. For the anti-melanoma assays, each melanoma cell culture was radiolabeled with tritiated thymidine ($^3$H-thy) and incorporation of the radiolabel into dividing cells was determined by use of a scintillation counter. We then compared cells treated with varying concentrations of filtered and unfiltered scytonemin against untreated control cells. Preliminary results suggest that increasing concentrations of scytonemin displays enhanced anti-proliferation properties against melanoma cells, some even inhibited growth of melanoma cells up to 98% compared to untreated cells. When using these same dilutions to observe the effect of scytonemin on spleen cells, increasing concentrations tend to have a greater effect on increasing spleen cell proliferation, some even increased ten-fold over untreated controls. Further research will use HPLC-purified fractions of scytonemin extracts and live mice to observe its effect on melanoma cells *in vivo*.
Characterization of the nature of *Rag5* mediated resistance to soybean aphids

Kumud Joshi
Department of Biology

Faculty Sponsor: Dr. Vamsi Nalam
Department of Biology

Soybeans (*Glycine max*) are a legume native to Asia but are grown around the world, including in the US. In 2016, 4.2 billion bushels of soybeans were planted in the US. The cultivation of soybeans have been severely hampered by the soybean aphids (*Aphis glycines*) which cause a loss of $3.6-4.9 billion annually. Popular management strategies for soybean aphids include scouting and insecticide application on plants that have more than 250 aphids per plant. This method has been effective for soybean aphid management but has several disadvantages, such as harmful environmental effects, intensive labor and high expense. By contrast, host plant resistance is a cheap and economical method of soybean aphid management. The discovery of soybean *Rag* or *Resistance against aphis glycines* genes has opened new paths for the discovery of better aphid management techniques. The mechanism of *Rag*-mediated resistance is not completely understood. The plant introduction PI 567301B contain *Rag5* genes that have exhibit strong resistance against soybean aphid in Whole plant however the resistance is completely lost in detached leaves. This data suggests a systemic response of *Rag5* that is not limited to leaves but the whole plant. Analysis of soybean aphid feeding patterns on *Rag5*plants using the electrical penetration graph techniques reveal significant differences compared to wild type. Grafting experiments provide further evidence of the systemic nature of the resistance. Using GC-LCMS analysis of the xylem and phloem exudates of *Rag5* plants indicates an important role for a secondary metabolite, Kaempferol in *Rag5* mediated resistance. Artificial feeding assays coupled with detached leaf assays supplemented with Kaempferol highlight the important role of this secondary metabolite on *Rag5* resistance to soybean aphids. Our results provide a characterization of the nature of *Rag5*-mediated resistance to soybean aphids.
Moving massasaugas to mitigate mortalities - Is soft-release translocation effective for managing a federally threatened rattlesnake?

Jillian Josimovich
Department of Biology

Faculty Sponsor: Dr. Bruce Kingsbury
Department of Biology

Wildlife translocation is a technique that involves intentionally moving animals in the wild from one location to another for the purposes of establishing new populations, bolstering critically small populations, or moving at-risk animals. Such practices may result in high mortality rates when released animals make large homing movements that can result in mortality from vehicles or predators. Soft-release is different in that the animals are kept in an outdoor enclosure prior to release in the hopes that they will acclimate to the environment, disperse more slowly, and be less inclined to seek their original location. To assist with ongoing conservation management efforts, we are exploring whether soft-release translocation is an effective tool for relocating federally threatened massasaugas (*Sistrurus catenatus*) at a military training center where they are frequently encountered on firing ranges under tanks, targets, and watchtowers. Since 2013, we have radio-tracked over 50 translocated and control massasaugas: 12 soft-released (i.e. held in enclosures for approximately two weeks prior to release), 10 hard-released (i.e. released immediately upon relocation), and 29 controls (i.e. released at site of capture). Comparisons of the behavior and survival of the treatment groups relative to one another using metrics such as annual survival rate, daily distance moved, and activity-range size will be conducted at a later date to determine whether soft release is a “successful”, cost-effective means of mitigating conflicts between massasaugas and the military. We hypothesize that translocated snakes will exhibit lower survival, greater movement, and larger activity range sizes than controls but that soft-released snakes will fare better than hard-released snakes. This study is continuing until at least the spring of 2019, and we ultimately hope that this work will contribute significantly to our understanding of the pros and cons of these translocation approaches for managing massasaugas, and, ideally, other imperiled taxa.
Starving to Go to College: Measuring Food Insecurity among IPFW Students

Grace Kessler
Department of Sociology

Alysha Brunton
Department of Sociology

Faculty Sponsor: Dr. Kim Lloyd
Department of Sociology

This study examines levels of food insecurity among undergraduate students attending Indiana University-Purdue University, Fort Wayne, during the fall semester of 2016. Measures of food insecurity mirror those used by the U.S.D.A. to assess levels of food insecurity in the national population. Analyses of 491 undergraduate students reveal that food insecurity is significant among IPFW students, but is lower than among the general population. Having children significantly increases food insecurity among IPFW students, while being married decreases the probability of food insecurity.
Explicit Content: IPFW Students’ Attitudes on Warning Labels and Restriction on Violent/Offensive Movies and Music

Ian King
Department of Sociology

Faculty Sponsor: Dr. Kim Lloyd
Department of Sociology

In this study, I hypothesize that conservative IPFW students and those who are parents will be more likely to support warning labels and sale restrictions on violent/offensive music and movies than liberal/moderate students and those who are not parents. Data was gathered from 411 students during the fall semester of 2016. Multivariate logistic regression analyses indicate that conservative students, those who are parents, females, more religious, and self-identified Republicans are more likely to support warning labels for violent/offensive movies and music. These students are also more likely to support a ban on the sale of violent/offensive movies and music to minors. Further analyses suggest that conservative students and those who have children are more likely to support a total ban on violent/offensive movies and music, while the results are mixed for more religious students and self-identified Republicans. These results support the findings of previous research in that socially conservative people are more likely to support censorship than those who identify as liberal/moderate.
The Firebone Family

Aidan Kiraly
Department of Visual Communication and Design

Faculty Sponsor: Professor Andres Montenegro
Department of Visual Communication and Design

I am presenting a creative project for an animated cartoon using traditional frame-by-frame animation. I chose to make the animation frame by frame with a style opposite to Disney quality of animation. I expect that the impact I want from this style of animation is that people can enjoy both visually and verbally. I feel that horror films would be fitting for the setting this cartoon takes place in since this cartoon does take place in a horrifying world like hell. I thought it would be neat to have a reference to Doom\textsuperscript{2} since in that game you play as a space marine who fights demons.

Synopsis:
As the man manages to dodge the onslaught of knives being swung at him, he hears the demon yell at him in a language that sounds reversed. The man then gets the idea to use a tape recorder that he conveniently had on him in an attempt to understand the demon. The language turns out to be English, but in reverse. This gives the human the idea to communicate to the demon through the tape recorder. The human tells the demon to stop attacking because humans don’t like being chopped up. Intrigued by these words, the demon stops attacking, curious to hear what the human has to say. After communicating through the tape recorder for some time, the demon signals to the little human to hold on for just a moment, and then looks for a more convenient means of communication. The demon spots a fishbowl with two goldfish back at his work table. Taking the fishbowl, he pulls one fish out and then jams it into the human’s ear, and then puts the other fish into his ear. After discovering that the goldfish allow the two to understand each other completely, the demon introduces himself to be Bruce Firebone. The human then introduces himself to be George Marino. After discussing for some time, Bruce decides that George isn’t such a bad guy and decides to invite George to stay with his family for the weekend.

In a cave-like house, Bruce introduces George to an abnormally tall imp woman with a thick Russian accent who goes by the name Klavdiya Firebone, who is just short of being Bruce’s height. Climbing on the wall is their son, Henry Firebone, a slim, normal-sized imp who is just short of George’s height. Coming out of a hole in the wall is the family pet disembodied hand, Handly, who tries to strangle George.

The main goal I have for this project is to develop a cartoonish style similar to the likes of Peter Hannan’s CatDog and to develop a style of writing based on Hanna Barbera’s The Flintstones and Seinfeld.

I hope for this project to help me better understand what it’s like to collaborate with other people and to improve me as an animator and develop cinematic narrative.

\textsuperscript{2} is a 1993 science fiction horror-themed first-person shooter (FPS) video game by id Software. It is considered one of the most significant and influential titles in video game history, for having helped to pioneer the now-ubiquitous first-person shooter. The original game was divided into three nine-level episodes and was distributed via shareware and mail order. The Ultimate Doom, an updated release of the original game featuring a fourth episode, was released in 1995 and sold at retail.

Applying 3D Vision and Remote Patient Monitoring (RPM) to Wound Care

Austin Kuhn
Department of Computer Science

Brett Galloway
Department of Computer Science

Nivetha Pandian
Department of Computer Science

Megi Shtika
Department of Computer Science

Mikah Sunderman
Department of Computer Science

Faculty Sponsor: Dr. Beomjin Kim
Department of Computer Science

Best practice in wound care requires regular assessment of the wound to determine the progress of healing. The accuracy of this assessment is essential as clinicians determine treatment based on this information. Measurement of a wound’s dimensions and coloration are both critical aspects of this assessment. A reduction in wound size and healthy coloration are good indications of healing. The current standard of care for wound measurement involves using a ruler or measuring tape to measure the wound’s length, width, and depth at their greatest point. This manual method of measuring has limitations as it does not provide an accurate assessment of the surface area of the wound, and there is room for error between those performing the assessment. Traditional methods also inconvenience the patient with travel to a medical facility and consume significant hospital resources in the form of personnel and space.

A system for remote monitoring of wounds by healthcare professionals via internet-enabled mobile devices equipped with stereoscopic cameras, has potential uses in the home, home healthcare, remote locations, extended care facilities and more. These mobile devices communicate with a web application to centralize patient imagery and analysis. Healthcare professionals will be able to remotely access the scaled images for examination, annotation, and historical comparison. With this information they can advise the patient without repeated office visits. Analysis such as color profiling in the assessment of the wound can guide treatment that could lead to better patient outcomes and satisfaction with their care. This project refines, extends, and integrates a prototype system that was developed by a senior capstone project team during the 2015-2016 academic year, with the primary goals of assisting healthcare professionals by minimizing opportunity for user error and increasing the effectiveness and fidelity of analysis. The effectiveness of stereoscopic 3D vision technology when applied to wound assessment will also undergo the beginning stages of user study. Additional features will include stereoscopic 3D vision display of wound imagery, color analysis, and the capability to upload stereoscopic images to the server directly from a newly developed mobile application.
On the Relationship between Sleep, Stress, and Academic Achievement in Undergraduates

Christopher LaFontaine
Department of Sociology

Faculty Sponsor: Dr. Kim Lloyd
Department of Sociology

Building on existing literature of the effects of sleep behaviors on academic performance, I examine undergraduate university students’ sleep behaviors including quality of sleep, duration of sleep, and stress as influences on academic achievement, measured by students’ self-reported grade point averages (GPA) and their score on their most recent exams. Data was gathered from 369 undergraduate students for analysis of self-reported GPA and 439 undergraduate university students for analysis of exam score. Findings of bivariate and multivariate regression analyses suggest quality of sleep and duration of sleep are not significant influences of academic achievement on either measure (self-reported GPA or score on most recent exam). Findings do suggest a significant negative impact of stress on the second measure of academic achievement (most recent exam score). Taken together, results do not support either hypothesis, thereby indicating other influences may affect academic performance of undergraduate students.
Biochemical Characterization of a Mycobacterial Acyltransferase Involved in the Metabolism of Long-Chain Fatty Acids

Jamison Law  
Department of Biology  
Faculty Sponsor: Dr. Jaiyanth Daniel  
Department of Biology

Latent tuberculosis affects about two billion people and is caused by dormant *Mycobacterium tuberculosis* (*Mtb*) that is phenotypically tolerant to antibiotics and relies upon triacylglycerol (TAG) accumulation for survival in the host cell. The mycobacterial glycerol-3-phosphate acyltransferase (mGPAT) is responsible for catalyzing the first step of the TAG biosynthetic pathway, but it has not been studied. Therefore, we cloned the open reading frame of a putative mGPAT and expressed it in *Escherichia coli* to study its function. We observed that cell lysates expressing mGPAT synthesized more $^{14}$C-lysophosphatidic acid derived from $^{14}$C-glycerol-3-phosphate and palmitoyl-CoA than lysates lacking the gene. This indicates that mGPAT is a functional enzyme in synthesizing the first product of the TAG biosynthetic pathway. Cell lysates expressing mGPAT also displayed increased radiolabel accumulation in polar lipids, suggesting that the product of mGPAT was further utilized in lipid biosynthesis. When cultured in nutrient-poor media supplemented with fatty acid, *E. coli* expressing mGPAT exhibited significantly higher growth rate during the exponential phase compared to *E. coli* lacking mGPAT. Interestingly, the opposite trend was observed when cells were cultured in nutrient-rich media. These results suggest that mGPAT enhances the ability of *E. coli* to utilize exogenously provided long-chain fatty acids for membrane lipid biosynthesis under nutrient-limiting conditions, which is similar to the conditions that *Mtb* experiences inside the human body. Metabolic incorporation of $^{14}$C-palmitate into lipids by intact *E. coli* cells was increased during the exponential phase when mGPAT was expressed. However, the incorporation of $^{14}$C-acetate was decreased. Our results suggest that mGPAT probably prefers exogenously derived sources of fatty acid for lipid biosynthesis during the exponential phase and its overexpression in the heterologous *E. coli* cell potentially inhibits the utilization of endogenously derived fatty acids for lipid synthesis.
Using Substrate to Predict Fish Assemblages in Cedar Creek

Gretchen Luchauer
Department of Biology and formerly known as Geosciences

Faculty sponsors:
Dr. Robert Gillespie
Department of Biology

Dr. Solomon Isiorho
Department of Biology

Cedar Creek is a stream system north of Fort Wayne. It is a highly channelized stream formed by glacial melt and a series of river captures. The lower Cedar Creek stream system is distinct from many of the other Northeastern Indiana stream systems due to it carving through the Wabash Moraine. This erosion pattern has formed a series of small valleys that are mainly forested until its confluence with the St. Joseph River. Hydrologic, habitat, and fish data were collected from three sites in lower Cedar Creek. These sites were known as Metea, Hursh, and Tonkel based on the names of a county park and roads, respectively. Hydrologic data included temperature, dissolved oxygen (DO), conductivity, pH, nitrates, phosphates, and flow rate. Temperature, DO, conductivity, pH, nitrates, phosphates, and discharge showed minimal differences among sites. Additionally, substrate composition is fairly uniform, with samples comprising mostly quartz, k-feldspar, calcite, organic debris, and asphalt. However, substrate particle size distribution varies among sites. Tonkel has the highest percentage of large gravel and cobble (>2 mm). Hursh has a high percentage of small gravel and sand (~2.0mm – 0.063 mm). Metea has the lowest percentage of gravel and has higher proportions of fine sand (0.250-0.125 mm) and silt (< 0.063 mm) instead. This substrate particle size distribution is then used to predict fish assemblages at each site. Several fish species known to live in Cedar Creek were separated into groups based on their substrate particle size preference because of their prey preferences. Fish with large gravel preferences are most common in Tonkel and Hursh. Fish with small gravel and sand are most common at Hursh and Metea, while fish with mud preference are most common in Metea. The results show that substrate grain size distribution can be used to successfully predict fish assemblages.
Biochemical and Microbiological Studies on the Functions of a Mycobacterial ABC-F Protein

Amanda Martin
Department of Biology

Faculty sponsor: Dr. Jaiyanth Daniel
Department of Biology

Tuberculosis (TB) is a prevalent cause of mortality due to *Mycobacterium tuberculosis*, the responsible infection agent. Both latent and active forms of tuberculosis can result from infection, with an estimated one-third of the world population having the latent form. Latent tuberculosis is dormant within the body, but TB can conceivably be activated in the event of immunosuppression. Antibiotic-resistant forms of the pathogen are emerging worldwide and the bacterial proteins involved in such antibiotic resistance mechanisms need to be studied. ATP-binding cassette (ABC) family proteins play important roles in the regulation of various physiological processes including translation, antibiotic resistance and cell growth. The protein EttA (or energy-dependent translational throttle A) has previously been found to be involved in the regulation of protein synthesis via the coordination of ribosomal entry into the translational elongation cycle. When ADP was present with EttA, the formation of the first peptide bond was inhibited thus preventing the continuation of the elongation cycle. A mycobacterial homolog of EttA, which belongs to the ABC-F protein family, also shows amino acid sequence homology with other bacterial proteins involved in antibiotic resistance. In order to understand the biochemical functions of the mycobacterial protein, it was cloned and expressed into *Escherichia coli* for purification and characterization. We conclude that the purified mycobacterial protein is capable of hydrolyzing ATP or GTP and releasing inorganic phosphate and that the catalytic activity is dependent on substrate and protein concentrations. Our ongoing experiments investigate whether expression of the mycobacterial protein modulates the antibiotic resistance properties of *E. coli* cells.
A Life Well Lived

Amanda Meadows
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

Most people have this stigma or preconceived notion that growing older is a bad thing. What I have found is that we can learn a lot from people who are more seasoned with age, and they are still living and experiencing new things each and every single day. I love hearing their stories, and I think they need to be shared. My project is a collection of these life experiences and reflections, titled “A Life Well Lived”.

To create this project I did extensive research through surveys and personal one on one interviews with the elderly population. Many of the people I interviewed multiple times, collecting stories and images about them. I asked them research questions and personal questions regarding their thoughts on aging. I compiled these stories into a project highlighting their outlook on life and their experience. Through this process, I began to understand how people feel about aging and hope to open up a dialogue on the subject. In this way, I hope to reduce the stigma and fear associated with aging.
The Battle of Tours

Nicholas Miller
Department of History

Faculty sponsor: Dr. Suzanne LaVere
Department of History

Historians long viewed the 8th century Battle of Tours as a defining event in the history of Europe, and interpretation of the meaning of this battle, both at the time it was fought and well after, has been fraught with controversy. My poster illustrates the beliefs held for centuries by many Westerners of the two dichotomous groups who fought this battle. They characterized the Muslims as expansionist and malevolent and trying to gain more territory and plunder. On the other side of the conflict, historians have viewed the medieval Christians as isolationist and respectable. These beliefs embody dogmas that are still evident among some groups even today. However, this poster suggests that even though these beliefs were upheld by scholars and in popular opinion for many centuries, these ideas are most likely false.

While this particular battle happened over a millennium ago, the way it was portrayed in Christian chronicles and later Western histories as a radical encroachment of Islam on Christianity has led to the widespread idea that Western Civilization would have been completely altered if the Muslim forces would have been able to breach the European might. The majority of medieval European Christians believed that Islam was certainly capable of becoming the dominant religion in Europe if this critical battle was lost. Where cathedrals and churches dotted the landscape, medieval Christians feared that mosques and minarets would take their place if the Muslims would have been able to complete their conquest.

For centuries, European historians and Western observers more broadly considered the Battle of Tours to be the climax of defeating Islamic invasion into the “civilized” West. The poster provides the background, location, and contenders of the battle, but also insists that this conflict may not have been as decisive as earlier writers have assumed. Primary sources from an anonymous Arab chronicler from 732, and two Christian writers, Isidore of Beja and St. Denis reveal perspectives from both sides of the conflict, and images from medieval European artists display a Christian bias. Ideas from secondary sources describing the battle from various angles are synthesized, and the modern relevance of this battle is challenged. This poster provides the viewer a clearer image of what happened at the Battle of Tours, and also what might have happened if Charles “The Hammer” Martel lost.
Infection with *Soybean Vein Necrosis Virus* alters soybean thrips’ feeding patterns

Sarah Moh  
Department of Biology

Geraln McGee  
Department of Biology

Faculty Sponsor: Dr. Punya Nachappa  
Department of Biology

Thrips are economically damaging plant pests. Not only does the thrips feeding on crops cause damage but they also serve as vectors for plant diseases such as tospoviruses. These viruses cause diseases that damage crops and lead to severe yield loss around the world. Studies with tospovirus, *Tomato Spotted Wilt Virus* have shown that virus infection changes the feeding behavior of thrips, causing them to probe three times as often as uninfected thrips. The tospovirus, *Soybean Vein Necrosis Virus* is an emerging disease that is vectored by soybean thrips (*Neohydatothrips variabilis*). The objective of this study is to determine whether infection with SVNV causes changes in the feeding behavior of the soybean thrips vector. The feeding behaviors of thrips, either infected or uninfected with SVNV, are monitored using the electrical penetration graph (EPG) technique. Electrical penetration graphs (EPGs) record electrical signals or waveforms when mouthparts of piercing-sucking insects, such as thrips, probe into a plant. Different feeding activities produce different waveforms, which can be analyzed to determine insect feeding patterns. Our results show that feeding behavior of infected thrips is significantly different compared to uninfected thrips. It is found that the most common probe type for the infected thrips was non-ingestion probes. Non-ingestion probes not beneficial for the thrips because they not ingesting the cell content. However, non-ingestion probes are beneficial for the virus because they allow the virus to be transferred. These results emphasize the coordinated evolution between tospoviruses and their thrips vector.
The Child and the Dog

Maria Mohan
Department of Visual Communication and Design

Faculty sponsor: Professor Andres Montenegro
Department of Visual Communication and Design

Modeling and Animation Creative Project

I am presenting a Creative/ Research project of a short animation movie using the technique of computer graphics 3D animation based on the work of Nathan Greno and Bryan Howard, the top animators for the film *Tangled*. The main purpose of this creative project is how to take a personal idea and to transform it into an animation, with the similar animating technique of both Nathan Greno and Bryan Howard, and how I can create using the methods and captivating style that Nathan Greno and Bryan Howard use to tell a story. The goals of my project are to understand more on how to use computer graphics, how to create a character and to understand the visual effects that are necessary to make an animation look clean and interesting.

The idea that came to mind was to take this certain animation style and turn it into a silent film. The main character would be a bullmastiff that helps children who have recently passed away. The children that the dog helps are considered lost. For the animation the bullmastiff finds children with no color. The dog then leads the child around to memorable places for the child to help regain his or her memory. As the child to starts to regain memory, color is added. Once the child fully remembers his or her child can pass to the other side. When that child goes away, the bullmastiff starts again with finding another colorless or lost child and starts again. The bullmastiff would take a dominate role to lead the children to regain their memories. This idea heavily depends on background music, as it would be a silent film.

I want to learn more about the process of building a character in a CGI system. I would be looking up how to design a character with the style of the Disney animated film *Tangled*, which is CGI.

The next thing that I would do would be to learn and research about some of the features to make a 3D film smooth and visually attractive.

My last goal is how to do a storyboard. I would research how to communicate a simple or a complex idea from the animator narrative standpoint.

The end result of this creative project will have an enormous impact in my future professional work as an animator, and to understand how to become a successful filmmaker in the animation industry.
The Effect of Endosymbiont *Arsenophonus* on The Population Size of Soybean aphids (*Aphis glycines*) on Drought-Stressed Soybean Plants.

Asif Mortuza  
Department of Biology  

Faculty sponsor: Dr. Punya Nachappa  
Department of Biology  

Authors: Asif Mortuza, Tyler Shuman, Dr. Punya Nachappa  
Department of Biology, Indiana University-Purdue University Fort Wayne, Fort Wayne, IN 46805  

*Arsenophonus* are mutualistic bacterial endosymbionts that are found in insects from a diversity of insect taxa, including aphids. The function of these bacteria in their aphid hosts remains unclear. The soybean aphids are a serious pest to soybeans in the North-Central United States. The insect is native to Asia and exotic to North America. They reproduce both sexually and asexually and give live birth. The goal of this study is to investigate whether the presence of *Arsenophonus* provides a reproductive advantage to soybean aphids during drought stress. Soybean plants subjected to drought stress and well-watered conditions (control) were populated with soybean aphids with *Arsenophonus* (ARS +) and aphids without *Arsenophonus* (ARS -). The results show that both ARS (+) and ARS (-) aphids did the best under well-watered conditions. ARS (+) and ARS (-) aphid population numbers are reduced on drought-stressed plants with ARS (-) having the lowest reproductive success. This result suggests that the presence of *Arsenophonus* provides a reproductive advantage to aphids during drought stress, but the exact mechanism is unknown and will need further investigation. Our study will increase understanding of the endosymbiotic relationship between the *Arsenophonus* bacteria and the aphids, which can be crucial for controlling aphids on soybeans.
“Anthropomorphic animals and animation”

Elizabeth Moser
Department of Visual Communication and Design

Faculty Sponsor: Professor Andres Montenegro
Department of Visual Communication and Design

From Felix the Cat to Judy Hopps, the animation industry is full of anthropomorphic animal characters. For my poster presentation, I will make a comprehensive study that explores both the history of these characters and the success of their designs. In doing this, I will be putting a spotlight on why these types of characters exist, as well as the influence they’ve had on their audience. Here is what I’ll need to do to achieve that goal:

1. Study the origins and history of these characters.
2. Analyze several different characters’ personality and design.
3. Compare and contrast anthropomorphic characters to similar human characters in how they exchange behavioral, psychological, and acting performances.
4. Replicate analytic findings with one or more example characters.

This project will help me grow as an animator in a professional setting, as so many large animation companies use these characters for their projects. Additionally, the conclusion of this project will be applied to other creative endeavors outside of animation such as character design for animal-based costumes and animal characters in comics and graphic novels.
Who Engages in Risky Online Sexual Activity?

Genni Newsham
Department of Psychology

Rachel Gilreath
Department of Anthropology
Department of Psychology

Logan Thacker
Department of Psychology

Faculty Sponsor: Dr. Michelle Drouin
Department of Psychology

Links between Internet activity and risky sexual behavior have been of great interest to researchers, and a growing body of research has begun to investigate how Internet addiction correlates with Internet sexuality (e.g., Döring, 2009; Judge & Saleh, 2013). In this study, we examined the links between Internet addiction, engagement in online erotica (which includes pornography use and the use of sex-based online chat sites), and engagement in both risky online sexual behaviors (which for this study was the sending of sexually-explicit pictures to those known only online, i.e. sexting), and the expectation to engage in offline sex with those known only online. Participants were 276 adults from the U.S. recruited through Amazon’s Mturk. Participants answered demographic questions in addition to completing measures of Internet addiction, pornography use, sex site usage, and engagement in risky online sexual behaviors.

While women and men were equally likely to send sexually-explicit pictures to online chat partners as well as show equal signs of internet addiction, men tended to engage in online sexual activities significantly more than women. Additionally, pornography use and sex site usage were sequential mediators in the relationship between Internet addiction and engagement in risky online sexual activities. Viewing pornography alone was not predicative of risky online sexual activities; however the use of Internet sex chat sites did predict engagement in sexting and expectations of offline sex with those known only online. From a treatment and intervention standpoint, these results suggest that it would be most useful to target specific online sexual activities (e.g. sex chat site usage) rather than treat internet sexual behaviors as one addictive behavior.
Faculty perception of accommodations for students with disabilities

Monica Ochola
Department of Professional Studies

Faculty Sponsor: Dr. Rama Cousik
Department of Professional Studies

Educational advances over the years has enabled students with disabilities to access educational opportunities in higher educational institutions, creating a diversification of the student population in higher education. This has necessitated faculty to increase their knowledge about providing appropriate accommodations for students with disabilities, as well as devise new pedagogical methods that cater to the different learning needs of students in their classrooms. This study was conducted to investigate faculty willingness to utilize inclusive instructional accommodations for students with disabilities in their classrooms, through an anonymous survey that was distributed to full time and part time faculty from a Midwestern University. Quantitative analysis of the data through SPSS showed that 79.1% of the participants reported a willingness to provide instructional accommodations in their classrooms. Qualitative analysis of the data reported that participants expressed a need for improved knowledge and training on how to provide certain instructional accommodations, citing increased collaboration and enhanced communication with the office of services for students with disabilities as avenues that would aid in fulfilling the gaps. This type of research study adds to the previous and increasing literature in the field, which focuses on how pedagogical methods can be enriched to cater for the currently diversified learning needs of the students at high institutions of learning.

Key Words: Students with disabilities, higher education, instructional accommodation, faculty perception, faculty knowledge
Situational Selection and Intergroup Relations

Emilee Parke
Department of Psychology

Faculty Sponsor: Dr. Jay Jackson
Department of Psychology

It is well established that favorable intergroup contact experiences reduce prejudice. We were interested in identifying personality variables that might lead some people to seek out favorable intergroup contact experiences and others to avoid them. Broadly, this process is called situational selection. Our main proposition is that the personality traits of openness, agreeableness, and authoritarianism influence the extent to which people seek out and enter into favorable intergroup contact situations, which, in turn, lead to favorable intergroup attitudes. The specific outgroups we examined for this study were Muslims, refugees, immigrants, the military, and Christian fundamentalists.

To test our predictions, we asked 293 participants to complete measures of personality, intergroup contact experiences, and intergroup attitudes. Our main hypothesis was supported. Intergroup attitudes were significantly affected by the personality traits of openness, agreeableness, and authoritarianism, and these relationships were mediated by contact experiences. However, the strength of the relationships was also dependent on which outgroup was being evaluated. These results have implications for contact theory, which has generally neglected the potential role of personality. In addition, our results reveal a potential mechanism (intergroup contact) that may help explain why certain personality traits are associated with intergroup attitudes.
"Only Child"

Paige Pelkington
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

For my creative endeavor symposium, I would like to focus on the topic of being an “only child.” I am a senior in IPFW’s Visual Communication and Design program, and I am currently in the process of starting my senior thesis on the same topic. Through national and regional research, I would like to be able to show statistics about being an only child, the positives and negatives, and also to be able to showcase this through photography. My photographic exploration of the experience of being an only child will start with me. I am an only child myself, and this will be the main aspect motivating my work.

I will be creating an online survey to ask peoples thoughts and opinions on what it was like to be an only child, or is like. I will then use my photographic images to showcase these findings. For this specific project I will interview six subjects, and include personal quotes in my visual design aspect of this project.

Carolyn Pendrick
Department of Biology

Faculty Sponsor: Dr. Benjamin Dattilo
Department of Biology

The brachiopod species, *Platystrophia Ponderosa*, thrived in high energy environments with only muddy shell gravels, and no solid surfaces for attachment. Brachiopods commonly attach by a fleshy appendage called a “pedicle”. Morphological features of *P. ponderosa* suggest the hypothesis that it did not rely on pedicle attachment for stability, but utilized a “passive implanter” strategy; it would settle to a suitable life position in loose sediment after disturbance by virtue of its distinctly spherical shape and a thickened shell for ballasting on the “bottom” side. The fact that juvenile *P. ponderosa* and adults of related species lack the characteristic shape and ballasting suggests that they depended on the pedicle. This study documents the developmental changes from juvenile to adult *P. ponderosa*.

The high-energy nearshore environment and muddy shifting shell gravels recorded in Maysvillian strata of the Cincinnati Ordovician are where the *P. ponderosa* specimens were collected. To release the individual valves, the rock slab were dissolved in hydrochloric acid. Brachiopods have two valves, a pedicle and a brachial valve. Multiple morphologic features were measured then compared graphically with hinge size. Hinge size represents overall body size. The different morphologic features were graphed against overall body size, and allometry was determined from the slope of each graph.

Positive allometry was found when comparing pedicle thickness to hinge length, meaning the pedicle valve increased in thickness more rapidly than overall body size. This fits the “passive implanter” strategy, where the shell thickening would have served as ballast, allowing the spherical body to roll into viable life position.
Promoting Civic Engagement, Cultivating Human Agency and Stimulating Environmental Justice

Isaac Puff
Department of Psychology
Department of Sociology

Elbert Starks III
Department of Sociology

Adam Stucky
Department of Sociology

Lakeya Smith
Department of Organizational Leadership and Supervision

Faculty Sponsor: Dr. Sherrie Steiner
Department of Sociology

We are providing residents surrounding the Hartford Iron & Metal (HI&M) facility with groundwater contamination results, distributing hand soap labeled with contact information for reporting violations to the Indiana Department of Environmental Management (IDEM), and collecting nine upwind/downwind moss samples to analyze for possible air contamination. Located in Blackford County, HI&M sits in the middle of a low SES residential neighborhood where many residents rent; it lacks a neighborhood association. Blackford County Concerned Citizens (BCCC) is investigating the concerns of residents in relation to the industrial history of the county in an attempt to improve public health.

Statistics indicate that Blackford County has significantly higher levels of three types of cancers – colon, thyroid, bladder – in Indiana. HI&M, IDEM and the Environmental Protection Agency (EPA) entered an agreement in 2009 and a 2010 site assessment showed soil samples that were contaminated with heavy metals and organic compounds. HI&M had not complied with the court order as of 2015 and IDEM is responsible for enforcement of that order and has been slow to force remediation.

Recent remediation efforts have been focused on groundwater contamination and municipality entities and have ignored other avenues of contamination, including air pollutants surrounding HI&M.

The goal of this service learning course is to cultivate human agency by development of collective consciousness that seeks to address the concerns of affected residents. We aim to address HI&M’s ecological impact on the surrounding neighborhood by empowering residents in light of institutional deficiencies.
Nutritional, Economic and Environmental Benefits of Wholesome Insects

Mary Pusti
Department of Public Policy
Department of Biology

Faculty Sponsor: Dr. Solomon Isiorho
Department of Biology

It is widely accepted that by 2050 the world will host 9 billion people. Today’s society already copes with nearly 1 billion chronically hungry people worldwide; factoring climate change effects and subsequent alterations in geology, there will be devastating effects on food sources. We need to find new ways of growing food and rediscover our original diets as Homo-sapiens. An insectivorous diet is able to provide essential proteins and nutrients to the human body. Insect consumption also offers a significant opportunity to merge traditional knowledge and modern science in both developed and developing countries. Placing insects back into the human diet will allow alternative nutrition, a healthier environment, and increased trade and economic development. This paper contains two surveys conducted in the hope of raising awareness of the many valuable roles that insects play in sustaining nature and in human life. The first survey, with 100 responses, sheds light on the misperceptions people have when considering eating insects. In the end, 39 of the 100 responses would choose insect diets over beef. The second survey of 200 responses gives the respondents nutritional, environmental, and geographical facts about insects before leading into questions in response to the facts given. Based on the second survey conducted, 88% of 200 respondents are more willing to try insects and believe in the changes that could happen globally if the insect diet were embraced. From the two surveys, it appears people are more willing to try insects after they have been presented with the relevant nutritional and environmental incentives. All it takes is education—and exposure to change people’s perceptions.
Data Governance for Gardeners: Bridging Information Systems and Technical Communication

Alexandria Rairigh
Department of English and Linguistics

Faculty Sponsor: Dr. Elizabeth Keller
Department of English and Linguistics

In this poster presentation, the author examines how core competencies of technical communication incorporate information systems and project management. The presentation explores particular data governance concepts that can be used to expand upon Hart-Davidson’s (2001) “core competencies of technical communicators” and Redish’s (2010) four elements of successful technical communication. Data governance defines roles and “assigns responsibilities for decision areas to these roles,” while establishing standards and ensuring compliance with strategies on an organization-wide basis (Weber, Otto, and Österle, 2009, p. 2). Technical communicators should be versatile and add value to their organizations and products (Dubinsky, 2015), as seen by the growing variety of competencies identified by Brumberger and Lauer (2015). These competencies connect technical communication to information systems and project management, as well as other fields. The presentation explores how this added value corresponds to Nardi and O’Day’s (1999) idea of the workplace “gardener,” an individual who grows productivity in his or her workplace. Specifically, this presentation demonstrates methods of bridging the fields of information systems and technical communication, elevating technical communication from its traditional support role by utilizing data governance concepts and versatile workplace “gardeners.”
“Revisiting animation/game designs from Temple Run and Subway Surfer”

Bailey Rassavong
Department of Visual Communication and Design

Faculty Sponsor: Professor Andres Montenegro
Department of Visual Communication and Design

I am presenting a Creative/Research project of a phone game based on the work of past successful phone games including Temple Run and Subway Surfer. The main purpose of this creative project proposal is to understand the design of characters and environment in order to create an effective and enjoyable game for kids. The goals of my project are:

1. Develop one character that would entertain children in an interactive basis through compelling graphics and gaming object manipulation.

2. Study past characters in other games and apply different characters that are memorable, and functional as a reinvented feature in future versions of this video game.

3. Understand and design the concept of an environment that would become an engaging immersive scenario for the character adventures, and interaction with the phone game users.

The conclusions of this creative project will have a great impact in my future professional work as an animator, and to understand how to become a successful 3d modeler in the industry.
Iron ooids from the Ordovician of Rochester, Minnesota

Kenneth Ray
Department of Biology

Faculty Sponsor: Dr. Benjamin Dattilo
Department of Biology

Ooids are millimeter-scale, egg-shaped accretions of minerals, usually calcium carbonate. Calcium carbonate ooids are common throughout geologic history and can be observed forming in a number of modern environments, so they are well understood. Certain ancient sediments contain the rarer iron oxide ooids, which have not been observed forming in modern environments and are poorly understood. This study is a characterization of such occurrence. The Decorah Shale is a sprawling formation of Middle-Ordovician marine sediment. The Decorah is mostly green-gray or black shale beds with limestone accessory beds. It is known to be rich in iconic Ordovician fossils such as brachiopods, bryozoans, horn corals, gastropods, crinoids and of course, trilobites. The Decorah shale is also home to an enigmatic collection of golden ooids. These ooids are found in quantities great enough to alter the appearance of the outcrops they appear in, resulting in a popular outcrop known as the Golden Hill roadcut in Rochester, Minnesota. Samples from the Decorah Black Shales were analyzed using a Scanning Electron Microscope (SEM). The typical golden ooid found appears to be approximately five hundred microns in radius, or one millimeter in diameter on its widest axis. The ooids are oblate spheroids, usually with similar or identical X and Y axes, and a shorter Z axis. The composition is almost entirely iron and iron oxides. Aluminum, silicon, magnesium and phosphorous are consistent trace elements, with trace amounts of potassium and sodium occasionally found. The ooids are embedded in calcium carbonate sediment with clays found in lesser amounts. Ooids are formed through accretion (snowballing) in aquatic environments. This results in onion-like layers of ‘flaky’ brittle mineral deposits forming on the surface of the existing ooid. The compositions of the inner and outer layers are nearly identical, with minute variations in iron and aluminum concentrations. Iron and aluminum appear to have a negative correlation, that is, higher concentrations of aluminum are found in layers that are less rich in iron. Unlike the normal well-oxygenated environments carbonate ooids form in, iron ooids are thought to form in reduced oxygen environments with water enriched with iron, aluminum and silicon (often volcanic on origin). Turbulent or oscillatory water movement is usually invoked as the mechanism that allows the ooids to form round concentric layers.
Coral Gable's Amazon Outreach

Daphne Reicher
Department of Visual Communication and Design

Avery Fiant
Department of Visual Communication and Design

Jessica Field
Department of Visual Communication and Design

Faculty Sponsor: Dr. Suining Ding
Department of Visual Communication and Design

This project is to design an educational center, The Coral Gable’s Amazon Outreach that is located in Coral Gables, Florida. Coral Gables is a cohesive community that creates harmony with the environment by blending color, detail and the use of the Mediterranean revival architectural style. The goal of this design project is to educate people around the world and help raise awareness to support the endangered species, and preserve their habitats.

The key concerns for why the Amazon Rainforest is in danger are deforestation and endangered species. Trees are cut down in order to build industries and make products that humans use in their everyday lives. This changes several habitats and causes the animals to leave their homes. They then try to survive in another area where they may not have everything they need in order to survive.

Inside Coral Gable’s Amazon Outreach, the central area is an open concept. This includes the reception and lobby, vending area, and bathrooms. On the right side of the building is the classroom and office. For privacy, the apartment is on its own on the left-hand side of the building, and the office and classroom. The apartment’s style is modern with neutral colors, which portrays a very clean, sleek look. The classroom holds thirty seats with the ability to move around the room freely. This particular strategy generates room for activities and group meetings. Furthermore, the goal was to break the tradition of stationed desks with chairs that will not be easily mobile.

For the design, there will be varieties of plants and water features to create an atmosphere like being in the Amazon Rainforest. Real tree trunks that were cut down because of deforestation projects in the amazon rainforest were recycled and used in the design. Photographs from previous mission trips are located on the walls throughout the interior. Sustainable products are used in flooring, furniture, and LED lighting. More windows were installed for daylight to shine into the space. The color palette is neutral in order to stay with more earth-like tones. These design features will encourage service learning, help raise awareness, and promote more people to embark on these life-changing mission trips.
The X-Men Rebooted

Veronica Rice
Department of Visual Communication and Design

Faculty Sponsor: Professor Andres Montenegro
Department of Visual Communication and Design

For as long as I can remember, all the best superhero cartoons belonged to the DC Universe. Batman, Superman, and the Justice League are series that kids and adults all immediately recognize and respect with Batman the animated Series is often considered the best animated series of all time. Meanwhile, where is Marvel’s big animated hits? Marvel’s only animated series that has stood the test of time, is X-men the Animated Series, which was produced back in the in the early to mid 90s. No other X-men series has had as much impact as that original series. Nor has any other Marvel cartoon series had the same impact as the X-men. Meanwhile, DC continues to churn out big animated hits with shows like Teen Titans, Young Justice, their new Batman animated movies. That is why I have spent the last 5 years developing plans to create and produce a reinvented X-men animated series that I will one day pitch to Marvel animated studios. By starting at the very beginning and following the original comic books I will weave a narrative that will introduce any new fan to the vast history of the X-men. By starting with the original team I can show how the characters originally began, track their development into the characters most people know today, and catch new fans up to the current comic book plotlines.

The series will be split into two parts, with the first part of the series being aimed at a 7-12 age range, and the second part being released a few years later to an older teen audience. The first part of the narrative will be 2 seasons long with 22-26 episodes per season. The episodes will have a “monster-of-the-week” setup, with an overarching plotline slightly dispersed within. The main team will consist of Cyclops, Iceman, Beast, Angel, and Marvel Girl with later additions of Shadowcat and Emma Frost. There will also be characters and plotlines introduced that will be fleshed out in the second part of the narrative. The second part of the narrative will be produced no later than 5 years after the first part ends. This part of the series will have a darker and more mature storyline, with serialized episodes. The new team will contain Cyclops, Marvel Girl, Iceman, Shadowcat, Storm, Colossus, and Nightcrawler; with Beast and Angel relegated to side characters. This team setup will change throughout the series. So far I have 3 seasons planned for this part of the narrative, along with plans for two movies. The main conflict in the first season will be between the X-men and Magneto’s Brotherhood of Mutants; the second season will delve into the island of Genosha and the abuse of mutants by the humans who live there; and the third season will introduce Apocalypse and the Phoenix Saga.
Short Animation based on Tim Burton’s cinematic technique

Kaleb Robertson
Department of Visual communication and Design

Faculty Sponsor: Professor Andres Montenegro
Department of Visual communication and Design

Creative project abstract:
I am presenting a creative project of a short animation movie using the technique of Claymation based on the work of Tim Burton. The main purpose of this creative project proposal is to understand animating technique of Tim Burton, and how he set modeled the characters and scenarios to create cinematic storytelling. The goals of my project are:

1. Develop a character based on Jack Skellington from The Nightmare Before Christmas to implement the technique he used to animate his puppets.
2. Study and apply the illumination technique used in his movies
3. Study and apply Tim Burton’s visual affects
4. Understand and apply how he used the camera to capture the Claymation animated scenes.

The conclusion of this creative project will have a great impact in my future professional work as an animator, and how to become a successful developer of characters in the gaming industry. This will help me in my further career is because developing characters and scenery will allow to further my knowledge with character development. Character development is a crucial part to video game design.
Living Without Sound

Paige Robertson
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

This project will be based on deaf culture and the awareness to the accessibilities and rights they have and the worldviews that are put on them. Because there are more than one million deaf people in the world, this is a topic that needs to be discussed and presented. I also want to inform people that may not know how to approach a deaf person and assist that person.
Temperature tolerance of filamentous cyanobacteria from Indiana Dunes State Park

Gabriela Romo
Department of Biology

Faculty Sponsor: Dr. Tanya Soule
Department of Biology

Biological soil crusts (BSCs) are associations between microorganisms and the surface of the soil that occur in relatively undisturbed soils exposed to sunlight. They have been shown to stabilize soils and contribute to nutrient cycling in otherwise barren soils. Cyanobacteria are important microorganisms in BSCs because they initiate their development, serve as primary producers, and provide stability for the BSC microbial ecosystem. BSCs are known for their presence in open areas such as deserts, although they can be found in the more temperate environment of the Indiana Dunes State Park in the sand dunes along the Lake Michigan Lakeshore. With increasing temperatures, it is unknown as to how BSC microbial communities will respond and how a changing climate will specifically impact the cyanobacteria within these soils. Therefore, the objective of this research is to isolate cyanobacteria from BSCs of the Indiana Dunes and observe their temperature tolerance in comparison to cyanobacteria from arid deserts of the western US. It is hypothesized that strains from the Indiana Dunes will be more psychrotolerant and respond more similarly to Microcoleus vaginatus from the Colorado Plateau, than Microcoleus steenstrupii from the Sonoran Desert. Two strains of cyanobacteria were isolated from the Indiana Dunes and, following PCR and sequencing, were determined to most likely be strains of Leptolyngbya and Pseudophormidium. These two isolates, M. vaginatus, and M. steenstrupii were allowed to grow for 20 days at 10, 25 and 35°C. Their growth and survival will be determined by changes in the amount of chlorophyll and statistically compared to identify any significant difference in temperature tolerance between these strains. If Leptolyngbya and Pseudophormidium are unable to grow in warmer temperatures then their ability to colonize BSCs may be affected and this will have unknown consequences to the microbial ecosystems they harbor as temperatures increase.
Intragroup cooperation in the face of gender discrimination

Maisie Ross
Department of Psychology

Gaeun Im
Department of Psychology

Faculty Sponsor: Dr. Jay Jackson
Department of Psychology

According to the rejection-identification model, when members of a group perceive group-based discrimination, they tend to more strongly identify with their group. Other studies have shown that group identification predicts cooperation with ingroup members. Combining these lines of research, we predicted that when gender discrimination is made salient, women will tend to exhibit greater gender identity, which will lead to greater cooperation when in a group with other women.

To test our prediction, male and female participants (N = 167) were randomly assigned to read a sexism-is-prevalent message, a sexism-is-not-prevalent message, or neutral message about cell phones. Participants were then randomly assigned to an online group consisting of five males or five females. The group faced a standard social dilemma. Each member was given 100 chips and had to decide how many to contribute to a shared group account. Cooperation (giving) helps the group but is economically detrimental for the individual.

Our hypothesis was confirmed. Female participants exhibited stronger gender identity after reading the sexism-prevalent message than after reading either of the other messages. Furthermore, for these participants, gender identity predicted greater cooperation when the other group members were females, but less cooperation when the other group members were males.

Since many, if not most, groups are composed of men and women, researchers have tried to determine how gender influences cooperative vs. selfish behaviors. Our study demonstrates that gender composition, gender identity, and gender attitudes all contribute importantly to cooperative intragroup behaviors, which can influence a group’s economic and social well-being. The results have implications for real-world situations, rejection-identification theory, social identity theory, and models of social dilemmas.
Branching Out

Saeed Abeer
Department of Visual Communication & Design

Tabitha Vachon
Department of Visual Communication & Design

Matt Spieth
Department of Visual Communication & Design

Faculty Sponsor: Dr. Suining Ding
Department of Visual Communication & Design

The Amazon Rainforest is the largest remaining tropical rainforest and is currently suffering deforestation due to climate change and harmful human interaction. Determined to make a difference, Save the Amazon, a non-governmental organization, is trying to educate people to overcome these pressing issues. The objective of this project is to design an education center that will teach individuals about the Amazon Rainforest and its aboriginal cultures. Save the Amazon facility, a 3700 square-foot interior space is to be located in Castellow Hammock Nature Preserve. In 1974, Castellow Hammock was one of the first environmental education centers located in Miami-Dade County. This 160-acre haven is the perfect location to provide an ideal learning environment for Save the Amazon because it is home to over 120 species of birds, 70 species of butterflies, and 370 species of trees and is a remnant of a tropical rainforest. The building includes an open concept floorplan with innovative ideas to address all learning styles. The modular classroom can be configured based on the teaching styles and different demonstrations taking place. An area for computer research is provided for guests, to present their findings with a projection screen. There is immediate access to the outdoors from the classroom for hands-on activities within the environment. Other spaces within the building are the director's apartment, office space, and a lobby/entrance area. The entrance area includes murals on the walls to immerse the individuals within the Amazon Rainforest while being in the Florida facility. A customized rug with a map of the Amazon Rainforest is displayed in the lounge area for individuals to learn where they may be located on their service-learning trip. To address deforestation, renewable and green materials were used within the space allowing a continuous improvement path that has been defined for optimizing product design and the manufacturing processes. Our rational for Save the Amazon is to capture the culture in terms of design, by providing an authentic learning experience for all students participating in the service-learning trip. All patterns and images within the space represent the indigenous tribes that reside within the Amazon Rainforest, like the Shipibo and the Asurini do Xingu tribes. This facility encompasses elements of nature and culture by bringing it into their work and learning spaces. The pillar in the entrance is designed to look like a tree trunk to bring the rainforest indoors, with natural lighting flooding the space. By making the facility nature conscious, our hope is to aid in the efforts of solving the issue of deforestation.
Children of Cienfuegos

Molly Schenkel
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

Cienfuegos Research

I am going to be documenting through photography, the lives of the people of Cienfuegos, located in the Dominican Republic. This is an area within the Dominican that has poor housing, few paying jobs and extremely poor living conditions. The people of Cienfuegos are considered squatters on land that they do not own. This is true even if they have built a house to live in. The area is so poor and destitute that people essentially find a small area of land and construct a very basic house to provide shelter. It is an area adjacent to the city of Santiago’s trash dump. This creates conditions in which many people living in the area, roam the dump for food, toys, and daily needs. These conditions have caused respiratory and gastric problems among many of the people here and is an unsuitable place for any human being to live.

I will be traveling to Cienfuegos for a week and performing research on these people and how their life is different than ours. I will also be taking photos in order to observe more fully and share the people of Cienfuegos’ way of life. After research, I will be comparing and contrasting their way of life with our life here in the US, as well as researching new ways to help these people change their life. My hope is that I can bring to light a very serious humanitarian crisis that is not very well know here in the United States.
Biased Intergroup Memories and Personality

McKinzie Schmidt
Department of Psychology

Isaac Puff
Department of Psychology

Madalyn Jehl
Department of Psychology

Faculty Sponsor: Dr. Jay Jackson
Department of Psychology

It has been established that the personality traits of openness and agreeableness are inversely associated with prejudice. We propose that these personality traits also influence group-based memories. In general, people have better memories for a person’s traits when those traits fit a stereotype (e.g., Linda the librarian was quiet). This is called the stereotype-consistency effect. Because people high in openness are less likely to rely on heuristic processing of information (quick, automatic thinking), we hypothesized that they would be less prone to the stereotype-consistency effect. In addition, because highly agreeable people tend to be interpersonally sensitive and non-judgmental, we hypothesized that they also would be less prone to the stereotype consistency effect.

To test our predictions, we asked 282 participants to complete established measures of openness and agreeableness. They were then presented with a story about a White American, African American, or Hispanic American person (randomly determined). The person exhibited multiple positive and negative attributes that were stereotypical and non-stereotypical of each ethnic group. Lastly, participants were asked to recall the person’s traits.

Our primary hypotheses were supported. Both openness and agreeableness were significant predictors of accurate recall of positive traits associated with outgroup members, and fewer errors when assigning negative stereotypic “decoy” attributes to the target person.

Our research demonstrates that some basic personality traits may play a significant role in understanding memory biases associated with social stereotypes. Our research contributes to recent efforts to integrate personality and situational factors that influence intergroup relations.
Impact of Soybean aphid feeding on a host defense regulatory gene \textit{PHYTOALEXIN DEFICIENT 4 (PAD4)} and its splice variants in Soybean (\textit{Glycine max})

Patrick Selig  
Department of Biology

Faculty Sponsor: Dr. Vamsi Nalam  
Department of Biology

Alternative splicing (AS) plays an important role in post-transcriptional regulation in higher eukaryotes. Technological advances in high-throughput sequencing over the past decade have revealed the extent of AS in several plant species. In soybeans, up to 63\% of genes undergo AS in response to a variety of stimuli such as light levels, water stress, and biotic stressors. With respect to plants defense, AS events have been observed in resistance (\textit{R}) genes. However, there have been no reports of AS occurring in defense regulatory genes. \textit{PHYTOALEXIN DEFICEINT4 (PAD4)} is an important regulator of host defenses. In soybeans, elevated \textit{PAD4} expression is associated with increased resistance to soybean aphids and nematodes. Interestingly, our research shows that an AS variant of \textit{PAD4} also occurs in soybean plants. Our data shows that the proportion of the \textit{PAD4} splice variant, \textit{PAD4-AS1}, changes in response to soybean aphid infestation. Therefore, the overall objective of this work was to determine the role of \textit{PAD4-AS1} in plant defense. The specific objectives of this study are to: (1) to determine the role of soybean \textit{PAD4} and \textit{PAD4-AS1} in Arabidopsis response to aphid infestation and (2) determine the sub-cellular localization of \textit{PAD4} and \textit{PAD4-AS1}. Towards this end, \textit{PAD4} and \textit{PAD4-AS1} have been cloned into plant expression vectors and used to transform Arabidopsis. Transgenic Arabidopsis plants that over-express soybean \textit{PAD4} and \textit{PAD4-AS1} will be evaluated for response to aphid infestation and to determine the sub-cellular localization of the proteins using confocal microscopy. Findings from this research will provide a better understanding to this important signaling system and better understanding of \textit{PAD4}'s role in host defense.
Microbial Diversity of Biological Soil Crusts of the Indiana Dunes State Park

Taylor Smith-Graber
Department of Biology

Faculty Sponsor: Dr. Tanya Soule
Department of Biology

Biological soil crusts (BSCs) are microbial assemblages that play important roles in the areas they inhabit, and can influence aspects such as local nitrogen flux, water infiltration, and plant seedling germination. In the dune environment, BSCs can form close connections with sand particles to stabilize dunes at their surface. Despite their potential critical role within Indiana Dunes State Park, little is known about their diversity, ecology, or interactions with plant communities there. The objective of this study, therefore, was to examine abiotic and biotic factors that influence dune BSCs, using Illumina high-throughput sequencing (HTS) to characterize these microbial communities. We hypothesized that specific environmental variables would influence BSC microbial diversity. In this study we sampled every 50m along a 550m transect, moving from the Lake Michigan shore inward to the hind-dune environment. At each sampling point soil pH, PAR, UV, and chlorophyll and scytonemin pigments were measured, and plant community cover, richness, and diversity were assessed. Moisture, conductivity, and nutrient content (total N and P) were also measured at every 100m. Overall, our HTS effort recovered 1,214,542 bacterial sequences across our 30 samples, and five major phyla were found to dominate our BSC samples, these being Proteobacteria (~20% of all sequences), Acidobacteria (~17%), Actinobacteria (~16%), Bacteriodetes (~17%), and Cyanobacteria (~10%). While there were no significant trends observed for BSC diversity moving along the transect, we did note a significant negative correlation for biological pigments and soil pH, suggesting a shift in the microbial community structure in response to these environmental parameters. The tendency for pH to structure terrestrial microbial communities has been noted in many studies; therefore, we are currently carrying out additional analyses to examine BSC community composition changes across our transect in relation to measured abiotic variables, with pH being of special interest.
Functional characterization of EaUraA, a putative nucleobase transporter of *Erwinia amylovora*, the bacterial causative agent of fire blight disease in apples

Amanda J. Stoffer, Dr. George S. Mourad  
Department of Biology

Faculty Sponsor: Dr. George Mourad  
Department of Biology

*Erwinia amylovora* is the bacterial causative agent of fire blight, a devastating disease that affects members of the *Rosaceae* family (e.g. apples and pears). Upon infection, *E. amylovora* enters the plant through surface wounds and travels in the vascular system resulting in blockage of water and nutrients to distal portions of the plant. This ultimately leads to necrosis of plant tissue with a blackened or “scorched” appearance. To establish infection, *E. amylovora* must uptake/transport nitrogen-rich compounds from the plant’s extracellular spaces into its own cell. This transport necessitates integral membrane protein transporters responsible for the movement of nitrogen-rich compounds and are ideal drug targets for protection against fire blight. The objective of this research was to identify the substrate specificity of *E. amylovora* EaUraA. To achieve that, the gene encoding EaUraA was isolated from the pathogen *E. amylovora*, sequenced, and expressed in *E. coli* deficient in its native UraA. EaUraA shares 84%/95% identity/similarity with *E. coli* UraA. *E. coli* expressing EaUraA was then tested for its ability to grow in the presence of a panel of different toxic nucleobase structural analogs. To elucidate EaUraA’s substrate specificity, *E. coli* expressing EaUraA were tested for their ability to transport several different radiolabeled nucleobases from the growth medium into the cells. Additionally, kinetic parameters (*K_\text{m}* and *V_\text{max}* ) were determined for the substrate.
A Miocene Cyprinodontiforme from the Nevada Test Site

Michael Stoller
Department of Biology

Faculty Sponsor: Dr. Benjamin Dattilo
Department of Biology

Fossilized remains of an unknown species of cyprinodontiformes (top minnows/pupfish) were recovered on the grounds of the Nevada Test Site. The specimens were found in Miocene volcaniclastic lake sediments and range in size from 6-10 cm. The original bone material of most specimens was missing, leaving behind high-fidelity natural molds in hard silicified silt. Silicone rubber molding compound was used to reproduce the original appearance of the bones. Images of these rubber casts were made with a high-resolution, flat-bed scanner and with a scanning electron microscope. From these images it is possible to compare the skeletal structure of these fish to modern and fossil representatives of related groups. Individual anatomical structures were recognized and identified by utilizing the disarticulated skull of a grass carp, found on the banks of the Ohio River. Notable structures are key to the reconstruction of lost species. Although the exact species has not yet been determined, it appears that only one species is represented, suggesting a stressed environment in these volcanic lakes. The high-resolution casts also show growth lines on the scales and ostracods in the gut, giving a clue to the trophic structure of the paleoecological community. Utilizing the information found in this study, we hope to accurately identify this previously unknown species and gain a general understanding of western N. America during the late Cenozoic era. Furthermore, we hope to accurately identify the ecological and geological environment in which these fishes lived, as well as any environmental stresses to which the fish may have been exposed. Information of this nature could prove useful for conservation efforts pertaining to similar, threatened ecosystems and organisms to date.
Adopt-a-Bow

Bethany Strasburg
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

Although 29% of fertility treatments resulted in a live birth in 2013, the cost, emotional stress, and physical toll is enough to have couples searching for an alternative option. Adoption is expensive, but it is a fraction of the cost of fertility treatments, without the physical toll on a woman’s body, and allows couples become parents. Through my research and project, I will examine the options of adoption and educate the viewer on the benefits and expenses that adoption has for interested people.

The research for this project centered heavily on the rules and intricacies for couples wishing to adopt, as well as the expenses involved. I explored some of the laws and regulations that are in place regarding adoption to help educate the viewer on this issue. This information will be demonstrated in my poster to visually showcase my findings. Through this process I discovered that there is a large financial burden on couples wishing to adopt.

To assist with the high cost of adopting, I have created a not for profit organization that helps relieve the financial stress on adopting parents. Funds raised through my Adopt-a-Bow organization will be donated to couples in need. The products created through my organization will be sold and funds raised will be given to couples who demonstrate a financial need and a desire to adopt.
Sedimentology and Geochemistry of the St Joseph River, Allen County

Harlie Summers  
Former Department of Geosciences

Kenneth Niswonger  
Former Department of Geosciences

Tessa Aby  
Former Department of Geosciences

Dan Deifenbaugh  
Former Department of Geosciences

Faculty Sponsor: Dr. Aranzazu Pinan-Llamas  
Department of Manufacturing & Construction Engineering Technology

The St. Joseph River Watershed is one of eight watersheds that make up the Maumee Watershed. This river was originally carved by the Huron-Erie Glacial Lobe approximately 22,000 years ago. Formation of this watershed ended approximately 12,000 years ago with the final retreat of the Erie Lobe. Over time, anthropogenic activity has altered the watershed by draining wetlands and turning the land into farm and cropland. Prior studies found that pesticides, pollutants, and nutrient loading were the main concerns in water quality, and that erosion and flooding were the largest overall concerns. Our study aims to analyze the St. Joseph River along four transects ranging from southeast DeKalb County to Allen County. Coarsest sediments were found near the center of the channel, while sediments fined toward the inner part of meanders. Longitudinally, the highest abundance of coarse grains was found toward the northernmost sample site (upstream). Based on our data, the grain size distribution depends on the geometry of the channel. Geochemical analyses of the water during a time span of five months (October-February) show a general decrease in the concentration of NO$_3$, PO$_4$, and SO$_4$, and a slight increase in the concentration of Fe$^{2+}$ and Cl$_2$. In the same months, while pH and dissolved oxygen readings were stable, total dissolved solids showed a general decrease.
A Short for Humor Based on Ren and Stimpy

Levi Tapia
Department of Visual Communication & Design

Faculty Sponsor:  Professor Andres Montenegro
Department Of Visual Communication and Design

Creative Project Inspired By John Krisfalusi’s  Ren and Stimpy, To Create Comical Heroes That Communicate Feelings, Emotions, Educatve, And Inspirational Outcomes.

I present a creative project animation inspired by the series Ren and Stimpy created by John Krifalusy to implement a ridiculous proportion of craziness to enjoy good humor. Also including a surreal style based on the work of Don Hertzfeldt.

Goals:

1. To create an original animated short performed by comical characters based on animals with human psychological dilemmas.

2. To learn and practice cel drawing animation through digital software such us Flipbook studio, Toon Boom, Studio Ghibli Open Toonz, and traditional cel set by peg bar lightbox.

3. To create a piece that will bring feelings, thoughts, and educative and inspirational outcomes especially for children, and vast audiences.

The conclusions of this creative project will have a great impact in my future professional work as an animator, and to understand how to become a successful storyteller and script writer.
Modeling the Spread of Influence in Social Networks

Kurtis Taylor
Department of Computer Science

Faculty Sponsor: Dr. Zesheng Chen
Department of Computer Science

Social networks play an important role in connecting people and facilitating human social interaction. Influence can spread through a social network. “Word-of-mouth” and “viral marketing” effects have been widely exploited to promote new products and technological innovations. For example, when an individual adopts a new product and finds it useful, she or he would recommend it to her or his friends and colleagues. One of this individual’s friends takes the advice, and may also feel excited about the product and spread the words about it to her or his own friends. In such a way, social influence can help diffuse new products or ideas.

Modeling the spread of influence in social networks is valuable to computer science because of its relevance to digital networks (e.g., online social networks), but this research also holds importance in other fields, such as epidemiology, physics, and social sciences. The goal of this work is to derive a mathematical model that can accurately predict the influence of individuals in social networks. Such an accurate model can help computer scientists in designing new network protocols, structures, and policies to facilitate the spread of influence or information.

Previous works on modeling the spread of influence assume the status of a single node in the network is independent of the status of other nodes in the network. In social networks, this is not true. For example, two friends in a social network tend to both either favor a product or reject it, meaning that the two individuals are spatially related to each other. In our work, we investigate the spread of influence in social networks using a Markov model, which assumes that neighboring nodes are spatially dependent on each other. To simulate the spread of influence in a social network, we use several generated network topologies and a real co-authorship network of scientists working on network theory, where the relationship between nodes is that author X wrote a joint work with author Y. We develop simulation tools in C++ to replicate influence diffusion through these networks. Our results show that our proposed Markov model predicts the spread of influence in a social network better than previously proposed models. To the best of our knowledge, this is the first attempt in studying the spatial dependence among nodes to describe influence dissemination.
Strategic Isolation Schemes for Pharmaceutical Agents

Hannah Thompson
Department of Chemistry
Department of Psychology

Faculty Sponsor: Dr. Steven Stevenson
Department of Chemistry

The use of gadolinium (Gd) compounds by the medical community has been well-established. A fundamental drawback to current MRI contrast agents is, unfortunately, the escape of gadolinium atoms. Gadolinium is a heavy metal and its release into the human body creates the harmful medical condition, Nephrogenic Systemic Fibrosis, (NSF) which is a rare and serious syndrome that involves fibrosis of the skin, joints, eyes, and internal organs. Evidence suggests NSF is associated with exposure to gadolinium (with gadolinium-based MRI contrast agents being frequently used as contrast agents for magnetic resonance imaging, e.g. Magnevist (MRI)).

In this research, our molecule has three gadolinium atoms that are trapped inside fullerenes, which are hollow carbon cages. The advantages of our molecules are two-fold. First, the entrapment of the medically useful gadolinium atoms prevents their release into the human body. Second, our gadolinium-containing metallofullerene molecules have three Gd atoms (e.g., Gd$_3$N@C$_{80}$, Gd$_3$N@C$_{88}$) when compared to just one Gd atom, as in the presently used MRI contrast agents. Whereas much research has focused on making Gd$_3$N@C$_{80}$ water-soluble for subsequent injection into the body for obtaining images, there is nothing published in the MRI community for Gd$_3$N@C$_{88}$ due to its more recent discovery.

Hence, the focus of our research is developing an efficient separation method for its isolation. In this poster, we present an efficient purification scheme for Gd$_3$N@C$_{88}$. Upon isolation, our research has collaborators who can subsequently evaluate its efficacy as a potential next-generation MRI contrast agent. Our role at IPFW is the synthesis and purification of new molecules, some of which may have medical uses.
Reclaiming The Rainforest

Stacie Trahin  
Department of Visual Communication and Design

Amanda Howell  
Department of Visual Communication and Design

Sarah Daubenspeck  
Department of Visual Communication and Design

Faculty Sponsor: Dr. Suining Ding  
Department of Visual Communication and Design

This project is located right outside of Miami in Homestead, Florida. Homestead is home to the Everglades National Park. This building is utilized as an education and orientation facility for those looking to embark on a learning voyage to the Amazon Rainforest. This location near the Everglades is the perfect opportunity for individuals to learn and experience real life scenarios. The biggest concern for the Amazon is deforestation and that is why our outlook on this building is “New Life”. With this in mind, this structure is meant to entice new life through igniting a spark to learn. One way to incorporate the concept of new life is to use recycled materials; along with the oceans, the Amazonian rainforests are the world’s biggest recycling unit for converting carbon dioxide into oxygen (The Amazon Rainforest, 2011). With the Amazon Rainforest located in the midst of nine different nations, there is much to be learned. The ambiance of this structure will emphasize that it is a place to learn. Included in the design is a interactive whiteboard, which enhances the service learning aspect of this facility. This design has many great features, which includes a remote conferencing feature that can be used for video conferencing with individuals who are in the Amazon (The Amazon Rainforest, 2011). Millions of Native Americans once populated the dense Amazonian rainforests, but now only about 200,000 are left due to deforestation (The Amazon Rainforest, 2011). The purpose of this building is to allow scholars to learn about wildlife, the effects of deforestation, the environment, ecosystems, biodiversity, among many other things. Our designed environment is not only aesthetically pleasing with its natural aspects, but it also will serve a purpose in this learning atmosphere. This will spark some curiosity, and with resources within reach, questions will be able to be answered, with the intent that scholars also learn additional information along the way. This is how the idea of new life is incorporated in the design of this educational complex.

Raccoon City

Elijah Vance
Department of Visual Communication and Design

Faculty Sponsor: Professor Andres Montenegro
Department of Visual Communication and Design

“Raccoon City” Creative Project Proposal

I would like to develop and create an animated television series that follows the events to occur within the first three Resident Evil Games, along with the events that take place in the prequel game, titled, Resident Evil Zero. The series would be three seasons in length. The first season would contain the events of zero and one within the same time. The characters all end up at the same place, and the events all tie together enough to make this a very clear story line, along with beginning events that led up to the entire destruction of Raccoon City. The second season would contain the events from the second game. This takes place within the city during the main events of the T-virus outbreak. The third season would be composed of the events of the third game, Resident Evil 3: Nemesis. This would detail the release of B.O.W.s from Umbrella Corporation in an attempt to wipe out survivors that would know the truth of the T-Virus’s intentional release into the public. The season would of course end with the final destruction of the city in order to cover all evidence of the outbreak. In summary, season one would cover the events that occur in the games Resident Evil Zero, and Resident Evil. The second season would cover the events that occur during Resident Evil 2, and the third season would cover all of the events in Resident Evil 3: Nemesis.

The games themselves are classified as survival horror. The movies that were made to follow the series strayed from these roots and it turned into more of an action series. My goal is to create a television series that replicates the uneasy feeling that one can get while playing the game. This can be done with lots of quiet and suspenseful moments, close calls, jump scares, and grotesque creatures. These creatures would all be different mutations of the T-Virus and even the G-Virus that are depicted throughout the first few games. The animations themselves will look much similar to the animations that are present within the two animated movies created from the series, Damnation, and Degeneration. The visuals used within these movies grasp that things need to look realistic, however these visuals within these animated films, mixed with the dark and dreary scenery in Raccoon City, could create a television experience that is true to the original survival horror franchise, and perhaps shed a new light on it’s brilliance.
Effects of *Cucumaria frondosa* extracts against melanoma cell cancer.

Luna Wahab  
Department of Biology  

Faculty Sponsors: Dr. Ahmed Mustafa and Dr. Elliott Blumenthal  
Department of Biology  

Melanoma cell cancer (MCC) is one of the most common skin cancers and the second leading cause of death in the United States. This skin cancer undergoes distant metastasis to the vital organs if not treated at an early stage. Current treatment options available for MCC have failed to satisfactorily halt the spread of this cancer. Patients are eventually left with the stigma of post-surgery scars and the toxic effects of the chemotherapeutic agents. In this research, we considered the possibility of a natural product, sea cucumber *Cucumaria frondosa* (*C. frondosa*); with important bioactive components as a preventive therapeutic option against MCC. These bioactive components include: monosulfated triterpenoid glycoside Frondoside A; the disulfated glycoside Frondoside B; the trisulfated glycoside Frondoside C; 12-methyltetradecanoic acid; eicosapentaenoic acid; and fucosylated chondroitin sulfate. Extracts of this sea cucumber have been proven to be effective against colon cancer, breast cancer, lung cancer, and pancreatic cancer. It has also been found to stimulate the cell mediated immune response in research animals. We have studied the effectiveness of the fluid present in the celomic cavity and different preparation of extracts of *C. frondosa* on the growth of murine melanoma cell line, B16-F10. Our results suggest that the extracts of *C. frondosa* have a potential of inhibiting the growth of MCC. The same extracts in sub toxic doses have shown an immunostimulatory effect by inducing proliferation of mice spleen cells. In future this marine invertebrate may be recognized as a potential nontoxic and natural source for preventing MCC progression and may play a promising role in reducing mortality and morbidity of the suffering population.
My goal is to create a new nonprofit organization that is focused on educating adults about exotic animals that were the result of impulse purchases. If the owners are unable or unwilling to fully care for these exotic animals, they are often let loose in the wild. Once they are let loose in the wild, they run the risk of dying due to living in conditions that are not fitted to their particular species. Also, there is the extra problem of adding an unnatural species to an environment, and having that species negatively affect the environment in which it was released. A perfect example of this is the terrible problem the state of Florida is having with the Burmese Python, which is severely damaging natural areas and wildlife of Florida, including the Everglades.

My organization will help educate owners that are wanting to properly care for the exotic animals they impulsively bought and, as a last resort, provide a place for owners to drop off their animals, if they find difficulties caring for them. The organization would then rehome these animals. While this problem exists nationwide, my prospectus will focus on a general education program for this region, in hopes that people in this area will become better educated before purchasing an exotic animal.

My goal for this project is to provide an avenue for potential exotic animal owners to become better educated before their purchase. I bought an exotic animal on impulse and soon after I realized that I was not prepared for the responsibilities of caring for the animal. Rather than get rid of it or let it out in the wild I decided to educate myself on the proper care for the animal. My project is a direct result of my desire that future pet owners will become much better educated before they purchase, or as a last result provide a safe haven for animals that owners no longer want to own.
Cutie Fruity

Emily Wendel
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

Current beer brands fall short in offering packaging and branding that is visually appealing to women. To solve this, I want to create a unique Beer Brand for Women using visual design that is different than many of the current brands on the market. My goal is to see if I can create packaging and promotional materials that will address the different buying habits of women. Through my studies and research at IPFW I have learned that men and women have different ideas on what is visually appealing. This research and study prompted me to explore this topic.

To prove this idea, I created all the branding, marketing and advertising material required for a new brand of beer. This new company will produce and package beer with designs implemented to appeal to the female market. I used colors and designs that were specifically created to visually appeal to my target audience. The proposed impact that my project will have is an increase in beer sales to women, and possibly a different way that other companies package and market to women.
ChromaClef

Kaci Whitehead
Department of Visual Communication & Design

Faculty Sponsor: Professor James Gabbard
Department of Visual Communication & Design

My project was created as a means to assist in the learning and understanding of reading music. The problems with learning to read standard music notation is that it involves different areas of the brain to work at the same time. Music reading activates the motor, visual, auditory areas in both hemispheres of the brain, along with the cerebellum. To deal with the problem, I have created a unique way of learning music that is designed to eliminate the dullness from standard music reading and inspire, inform, and motivate people to experience music in a completely different way.

My business idea, ChromaClef is a beginner’s education program that teaches users how to read sheet music in a non-traditional way that is easy and exciting for everyone, no matter the musical background.

ChromaClef combines color and music together in an aim to improve musical memory and understanding, proven by a process called synesthesia. Synesthesia is an unusual blending of senses in which the stimulation of one modality simultaneously produces sensation in a different modality. In this case, every note (or letter) is associated with a different color. This is called Grapheme-color synesthesia. Those with this form of synesthesia have enhanced visual memory for stimuli. Why? Some researchers believe it is due to a cross-wiring in the brain where a number or letter stimulates an area of your visual cortex that simultaneously responds to color stimuli.

Not only does this color-to-music combination work because it enhances memory and comprehension, but it stands apart from every music-learning method because of its anomalous way of doing so. This non-traditional way of self-teaching allows users to learn on their own time and at their own pace.
The Influence of Diaspora Groups on Terrorist and Insurgent Actions and Behaviors

Travis Wise
Department of Political Science

Faculty Sponsor: Dr. Michael Wolf
Department of Political Science

Problem: Global economics, modern warfare, and natural migration have created diaspora groups in almost every state on the globe. These diaspora often split their allegiance between their new country and other ideals such as their religious beliefs, culture and heritage, or their former homeland. Terrorist groups actively try to recruit, or even create, diaspora groups to sympathize and network with their cause.

Method: This paper looks to previous academic research on how diaspora interact within the allegiances to create specific political outcomes. In total seven diaspora groups are analyzed. Five are active in influencing terrorist groups, while two act as controls to see alternative methods and approaches of diaspora and terrorist group actions. This macro approach to diaspora groups compares outcomes and the techniques that were used to produce those results. It looks to find commonalities or contrasts and to find tools to influence diaspora actions, giving states a means to influence the most positive outcome.

Results: By looking at multiple diaspora groups at scale, the research shows many factors are similar in helping fight violent actions. This research also showed that terrorist groups can exist without diaspora interaction. Through political actions, diaspora groups can be highly influential in finding solutions that can curb the influence and size of terrorist groups, or can give them enormous power if the diaspora is agitated and supportive of violence. Terrorism will continue, but this paper shows that handling the growing class of diaspora groups is a manageable feat and they can help to alleviate some terrorist actions.

Conclusion: This paper has found that there are definite measures that contribute to diaspora influence of terrorist groups. Expanded research can further examine specific outcomes and consequences of interactions between terrorists and sympathetic diaspora populations. With a fuller understanding of diaspora interactions the chances of peaceful solutions are elevated which can decrease the chances of violent attacks and the need for military or police action.
Carnapian explication is the process of making an informal, vague concept more exact and useful by transforming it into a formal concept within a system (e.g., scientific language, first-order logic). In our presentation, we rely on Carnap’s views of logic and formality to inform an approach to the general Formality Problem:

Given an informal concept $x$ and a corresponding formal concept $y$, is any formalization procedure $f$ (that transforms $x$ into $y$) limited by $x$ or $y$ with respect to level of formality?

For example, we have an intuitive, informal concept of temperature, of when an object is qualitatively hot or cold. In the sciences, we have a corresponding formal concept of temperature that is quantitative and measures the movement of particles. Here the Formality Problem asks if the level of formality of a process that assigns quantitative values to our informal concept is limited by the level of formality of the informal concept or the formal concept. This problem has implications that extend to contemporary issues in artificial intelligence research; in particular, an answer would determine how formal a representational system of an artificial reasoner must be to reason over other representational systems. Further, work on the Formality Problem could reveal the necessity for future AI research of constructing a precise, general definition and diagnostic for level of formality.
It’s True! No One Knows You’re a Dog on The Internet

Nicholas Yergens
Department of Psychology

Eli Hernandez
Department of Psychology

Miriam Greidanus Romaneli
Departments of Psychology and Communication

Jordan Brown
Department of Psychology

Faculty Sponsor: Dr. Michelle Drouin
Department of Psychology

Research on the representation of online identities has demonstrated that individuals’ representations are oftentimes disconnected from their offline selves (Suler, 2004). Hence, people may not be truthful about who they are online, and online deception is a major category of online fraud (Donath, 1996; Hancock, 2007). Accordingly, many people (one-third to a half), confess to lying about their identity online (Caspi & Gorsky, 2007; Drouin, Miller, Wehle, & Hernandez, 2016; Ellison, Hancock, & Toma, 2012; Whitty & Carville, 2008). Lincoln and Coyle (2013) found that in their Australian college sample, participants were very adept at estimating the actual age and gender of an online chat partner even when that participant was pretending to be a 13-year-old girl. In this study, we examine whether changing sample characteristics and setting affect how believable a fictitious persona would be in online chatrooms.

We extend Lincoln and Coyle’s (2013) research by creating a more naturalistic protocol, having (1) “neutral agents” (i.e., research assistants working off of a basic online persona of a 13-year-old) interact with participants, (2) via an online chat portal (Chatzy), and (3) using both a college sample (n = 136) and an Amazon Mechanical Turk worker pool (MTurk workers are U.S. residents paid for their participation in online surveys) (n = 126) samples. Participants also complete a demographic survey, several personality measures, and are debriefed after the study.

Across all conditions, there are no significant differences between college students and MTurk participants in their age estimations or their belief of the gender portrayed by the confederate. Participants in all four experimental conditions estimate similar ages for their chat partner, with means between 13 and 14 years old. Notably, none of the characteristics measured are significantly related to age estimation; however, those high in Machiavellianism and those low in honesty/humility are more likely to state that a picture provided by the confederate is believable.

In contrast to Lincoln and Coyle, adult participants generally believe a teenage persona encountered in an online chatrooms. The implications from this study suggest that law enforcement agents using online personas in chat rooms should incorporate the use of both stylistic and content cues to convey age.
For more information about the Student Research and Creative Endeavor Symposium:

▼ http://www.ipfw.edu/offices/sponsored-programs/
▼ http://opus.ipfw.edu/